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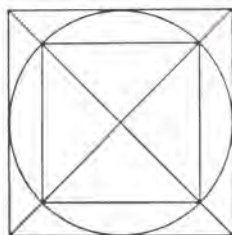
The magazine in English, German and French for applied medium- and large-format-photography.

- 5 *It's photokina year can we expect anything new?*
- 6 *The spell of the theatre*
- 13 *Flowers and how to photograph them*
- 20 *New aspects of colour technology*
- 28 *Who's afraid of dragons?*
- 31 *Catalogue photography*
- 34 *Those little details are worthy of your attention*
- 37 *Technical news*
- 43 *Has Super 8 technology now achieved perfection?*
- 46 *16 mm cameras*
- 52 *Problems in television engineering: what is electrostatic storage?*
- 53 *Problems in television engineering: common terms in television illumination*
- 54 *Cibachrome a print system*
- 58 *Large and medium-format photography in the war against crime*
- 63 *Combi development of lith material*
- 63 *Let the colours run*
- 64 *Manipulation what is that?*
- 67 *An interesting observation: marvel in an egg-shell*

This photo of a blue-tit, which belongs to the species of passerines, was taken by Hans Gundel, Neumühle near Schwabach.

In his profession, Hans Gundel is not a photographer in the real sense of the word. He is actually a retoucher at a letter-press and offset printer's, Hermann Millizer ("Verlag Schwabacher Tagblatt"), and has produced a calendar of outstanding bird photography. This is only one of the truly masterly nature studies. Is he pleading in favour of greater freedom for birds? Linhof Master Technika, 150 mm Symmar, 1/250 sec. at f 8, cropped from a 4x5 inch Agfachrome 50 S transparency.

Water roses
Photo: Klaus Hackenberg, Lauffen am Neckar.



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IT'S PHOTOKINA YEAR

CAN WE EXPECT ANYTHING NEW?

It's time for the photokina again. From the 10th to the 16th September 1976 the world's greatest show for the products of the photographic industry will be taking place in Cologne — once again with the exclusion of the general public. As most readers must know, the last time the exhibition took place (1974) the so-called amateur was not permitted to enter. The new arrangement seems to have proved successful, and business was said to have run more smoothly. The amateur just had to obtain his information elsewhere. Through his camera dealer, perhaps?

What retailer can still afford the luxury of a full customer advisory service? The profit margin has narrowed, the competition is even keener and the buyer more critical in his choice. If he is therefore denied the opportunity of informing himself at fairs, he will soon be lost to the trade entirely. Perhaps one should modify that statement. The attitude of the photokina organizers seems to be that only the "poor amateur" is undesired. Anyone who can pay the exorbitant price for the admission ticket must, indeed, be an enthusiast — he is granted entry to the holy of holies!

More than 600 manufacturers have already confirmed that they will be participating in the photokina, which is taken as a sign of the great interest. Yet, many of these manufacturers are dissatisfied with the fair. They criticize the two-year cycle with the attendant haste. Hardly have they recovered from one exhibition when they are faced with the next. The obligation to produce something new at all costs usually results in some manufacturers turning up with half-finished or immature products. This is

understandable, since what is the point of a stand with absolutely nothing new on it. So, design departments are kept busy, and novelties are developed, but often enough the results are not really what the market needs. The great sensations of recent years such as the Super 8 format, the 110 system, Polaroid film, or the first 6×7 SLR cameras have only occurred at reasonable spaced intervals of 4 to 6 years. Therefore, why not enjoy a well-earned break? The suggestion of introducing a three-year cycle is not new. It has been called for on many occasions by manufacturers in the cine and photographic industries, has even been vigorously demanded. A number of large firms have threatened to withdraw their support if the present situation continues.

What advantages would such a three year rotation bring? Technology in general has become so complicated nowadays that the present two-year rhythm simply places unreasonable demands on the industries concerned. After all, the new products must be developed to perfection and proven on the market. It is, indeed, possible to design apparatus within this period but it may not be so void of teething trouble that it can be merchandised without serious consequences. Marketing departments are subjected to enormous pressure, and small firms do not have sufficient stamina to maintain the deadly pace. For example, it was previously possible to prepare tools, dies and moulds in four to five months. Today one requires four to six times as long to set up such tooling facilities. It is clear that the question of unprofitability must soon be raised.

Certainly, each generation takes photography one step nearer to perfection. However, the "novelty" of these new products is often delusive, because there simply was insufficient time to create something *really* new. The major manufacturers realized quite some time ago that the Photokina is by no means the only forum for a presentation of new products. This is the reason why some firms become "delinquent" and introduce genuine novelties to the public before or after the photokina has taken place. In 1973

Polaroid came out with the astonishing 105 P/N film, the Rollei flex SX was presented outside the framework of the fair and Kodak preferred to introduce the new Kodachrome and Vericolor films to the public via the trade press. Linhof put the new 6×7 cm Technorama on to the market long before the photokina — in other words, one could easily obtain the impression that the photokina is becoming increasingly regarded as a necessary evil; participation is desired, but it has no longer the publicity value which it was previously accorded.

In view of this dissidence and the exclusion of amateurs from the Cologne fair, one might ask whether the flow of information has not been disrupted. Quite apart from the countless periodicals and other organs in the fields of still and cine photography and audio vision, a number of firms have begun to organize local shows in Germany to fill this gap. These "supplementary shows" travel from town to town, providing amateurs and professionals with the latest product information. The value of such exhibitions is to be found in the fact that absolutely brand new developments can be presented at short notice, and the prospective customers involved are not obliged to undertake expensive journeys or pay a high price of admission. Thus, the Foto-Information GmbH., consisting of the firms Gossen, Homrich, Liesegang, Linhof, Meteor and Multiblitz, was recently founded in Munich. The aim is to organize such local shows on a joint basis and support marketing activities with a magazine entitled "Informationen der Fototechnik". Jobo, Durst, etc. formed a similar group some time ago and it proved very successful. Such endeavours are generally in the interest of potential customers, and the firms involved have not complained about lack of business.

Let us therefore hope that the increasing criticism of the Photokina will be heard by the Cologne organizers and that action is then forthcoming. The photokina should then have every chance of regaining its reputation as the most important fair in the world for the photographic industry.

Driss Nasser

Photography in water, or involving water, is difficult, because the model's make-up usually suffers from this treatment. In such cases the photographer should take care that the cosmetics used are not spoilt by water.

Franz Lazi, a photographer who we do not need to introduce, shows here that he is, amongst other things, a master of lighting techniques.
8×10 in. Linhof Kardan Color, 1/125 sec. at f 8, Ektachrome Professional.

THE SPELL OF THE THEATRE

Hilde Zemann

Top: A scene from "Faust" with Gustaf Gründgens.
Photo: Rosemarie Clausen, Hamburg.

Below: Ionesco — "Die Stühle" with the actors Martin Benrath and Elisabeth Orth in the Residenz-theater, Munich.
Photo: Hilde Zemann, Munich.

Black-and-white photo right:
Scene from "Rheingold" by Richard Wagner in Bayreuth.
Photo: Siegfried Lauterwasser, Überlingen/Lake Constance.
4×5 in. Linhof Technika, Ilford HPS film,
1/10 sec. at f 2.8.







THE SPELL OF THE THEATRE

First, one must understand and learn to love this strange world with its somewhat crazy, sensitive, egocentric and yet so likeable players. One must feel one belongs to it, as a member, as an interpreter. The photographer must be readily accepted by all those who make up the theatre: the actors, the director, the stage designer. Anyone who does not succeed in this role will always remain a foreign body, an outsider who is merely tolerated.

This word of warning is aimed at all those who entertain grand illusions about the theatre world but have never come to terms with its realities.

The actual work of a stage photographer

Several weeks before the première, the photographer must already know exactly what is on the programme, have read the script and have made himself familiar with the intentions of the director. (An ideal case, though, he is usually not approachable at this time). The rehearsals should be studied as often as possible, since even at this stage a number of test photos may be taken. An important moment is the first dress rehearsal on the original stage which the photographer should study from the auditorium. He should now observe the most favourable lighting angles and jot down notes about the best camera positions for the main scenes. Provided with such knowledge, he then attends the first full rehearsal when photos are taken. Before going further, however, a word about lighting is appropriate. The choice of illumination is the most important element in the production of a play. The atmosphere which the director wishes to conjure up must be fully recorded in the photograph. So, flash is out of the question! For such photography one should use ultra-high-speed film, even when the stage is brightly illuminated. This simply means that one can use shorter shutter speeds, which is of great advantage where movement is involved. If the worst comes to the worst and the light is very low, one can resort to special development in the case of black-and-white. Possibly an even more serious problem is the contrast which often prevails. In those instances where the main actor is picked out by a bright spotlight against a dark stage full of dark

Left:

A scene from the play "A Glass of Water" with Gustaf Gründgens and Lieselötte Pulver. The photographer has intentionally not cropped the spotlight at top right, thus emphasizing the "working character" of this shot. Such photos may only be taken from behind the stage and thus present an angle of view not so well known to the theatre-goer.

Photo: Rosemarie Clausen, Hamburg.



"Meistersinger", Bayreuth.

The type of illumination employed at the Wagner operas is usually very suitable for stage photography. Photo: Siegfried Lauterwasser, Überlingen/Lake of Constance. 4x5 in. Linhof Technika, Ilford HPS, 1/15 sec. at f 4.5.

costumes, it is recommended to try a surface-acting developer highly diluted in conjunction with an increased developing time in order to compensate for the contrast. This, however, is all a matter of experience, and the same applies to the exposure time which is difficult to measure accurately with a meter.

During the rehearsal

One should have taken up position in the theatre half an hour before the rehearsal is due to commence. The cameras, medium-format apparatus fitted with lenses of various focal lengths, are set up at decisive viewpoints which have been determined beforehand on the basis of the notes one has made previously. For close-ups of the actors, for example, one must take a position in the footlights. On the other hand, a good overall view is often best obtained in the auditorium or, alternatively, from the balcony. It is essential that the theatre photographer thoroughly familiarize himself with the script, since he or she will have no way of telling when the actor is about to assume a dramatic pose or, if desired, keep still for a second. A number of photographers in this field do prefer to take this kind of shot on conclusion of the rehearsal, getting them to re-act short scenes under possibly improved lighting conditions. This may be justifiable in the case of publicity material for daily newspapers, since the photo must be sharp and easily printable. For exhibition prints, on the other hand, this method is not recommended. Quite apart from the fact that the actors are likely to be too exhausted after the rehearsal to find the right mood again, the spontaneity will also be lost. That which an actor now has to offer will be a mere shadow of his former facial expression.

It must be obvious that before the rehearsal begins all the cameras should be ready for operation and extra film at hand. After the first act has commenced any unnecessary juggling with equipment should be avoided. Apart from the cameras mounted on tripods, one should also have two hand-cameras and a set of lenses with which one can move around looking for interesting angles. Dark clothing and soft shoe soles are also recommended, since one must naturally be sufficiently sensitive to know when one might disturb the rehearsal. Now one assumes the role of the hunter—always on the prowl, always ready to shoot. This aspect of theatre photography, all those little points on the side, so to speak, is what actually makes it so interesting. Here



one needs a keen eye for apparently insignificant incidences, but which could make an important shot. One must know which scenes are interesting from the footlights, from above the props or from the wings. In fact, one must be everywhere at once! The theatre offers an abundance of picture material which is hardly to be found in such condensed form anywhere else in life. A reliable assistant to reload the cameras at the right moment is worth her weight in gold.

Selecting the best photos

Film consumption is enormous, but this is only to be expected and is worth while. Later, contact prints are made from the developed film. From the vast quantity of prints one is faced with selecting ten to twenty of the best, photos which give a really vivid impression of the director's style and mode of expression and show the individual actors and stage decoration at the most favourable angle. The last "act" of all takes place in the darkroom. Here miracles are performed in order to coax a perfect enlargement from an underexposed negative and reveal the spell of the stage—through darkroom magic.

There thus ends for the photographer a time full of intense concentration and apprehension, yet great enjoyment. The finished print in the showcase is the "première" for the photographer. He is said to have been successful if he manages to give such a realistic impression of the play's character that passers-by stand for a long time in front of the showcase.

Page 10 top:

"Faust I" under the management of Gustaf Gründgens with Will Quadflieg as Faust and Anljé Weisgerber as Gretchen.
Photo: Rosemarie Clausen, Hamburg.

Centre and below:

Two typical stage scenes by Christian Carez, Brussels (taken from "Mother Courage").

Colour page right:

"Boris Godunow" in Salzburg.
Photo: Hildegard Steinmetz, Gräfelfing near Munich. Overall views of such high quality can only be obtained with the aid of a large-format camera. The photographer, who works on assignment from the Theater am Gärtnerplatz in Munich, employed a 5x7 in. Linhof Technika and Kodak Ektacolor L negative film. It is most important in theatre work that the shutter functions as silently as possible. The electronic type of leaf shutter is practically inaudible.





Colour page left:

"Paphiopedilum" (hybrid).

Photo: Karl Liedl, Schleißheim, near Munich. The exact rendition of this flower calls for an almost symmetrical arrangement. 4×5 inch Linhof Super Technika, Agfachrome 50 S.

There's no doubt about it: flowers are difficult subjects to photograph. The peculiarity of this sector of photography is to be found in the fact that the rich *variety* of colours and *shades* of colour are often the sole criteria by which a particular species of delicate plant can be identified. We have thus touched upon the most obvious problem here: how should one set about photographing flowers? Is, for example, colour the only legitimate medium or are there also arguments for black-and-white?

The question must be treated in somewhat greater detail. Even scientists, who are less concerned about the aesthetic aspects of botany, do not always need colour film for their photography. They are often not only content with b/w reproductions but even prefer it that way. However, exact information, respectively instructions, about type of lighting, scale of reproduction, cropping and selected details are important to them and might be regarded as the four basic "factors" which must be observed if b/w photography of plants is to be scientifically evaluated.

With respect to lighting

Matters should be arranged in such a way that no hard shadows are formed which might cover up important parts of the plant. Since we are less concerned here with flowers as purely "creative elements", it is necessary for the sake of clarity to ensure that the contours stand out against the background. To this end, one can use back-lighting (which improves the translucence) or an appropriately lighted sheet of carton. Lighting from the side should be avoided or only



This black-and-white photo was also taken by Emil J. Javorsky. It shows an *aechmæ fulgens* discolor, as the botanists call it.

employed as a highlight source when the general level of illumination is sufficient to prevent hard shadows. Fancy effects in lighting should be reserved for personal experiments; it is unlikely that any publisher or client will expressly desire such tricks as lighting from directly below, unless it is to pick out one part of a plant.

A matter of size

Since flowers are generally not very large subjects, this kind of photography usually takes place at close quarters and may even delve into the sphere of photomacrography. One should try to fill the film format with the plant and take trouble to get as much of it as sharp as possible. Of course, the depth of field is dependent on the focal length and the scale of reproduction.

A question of detail

It need hardly be emphasized that the most important point of all is to bring out the exact detail in every plant; without this it is not possible to study the fine structures in a flower. One must strive for good differentiation and depth in the grey tones. Generally speaking, it is only possible to absolutely satisfy all these conditions with the aid of a large-format view camera. The last remark applies even more flower photography in colour.

Perfect interplay between the various criteria mentioned, such as lighting, picture section, sharpness and the rendition of detail, is probably the most essential point to remember in this field.

D. Nasser

FLOWERS

AND HOW TO PHOTOGRAPH THEM

Double spread (Page 16—17)

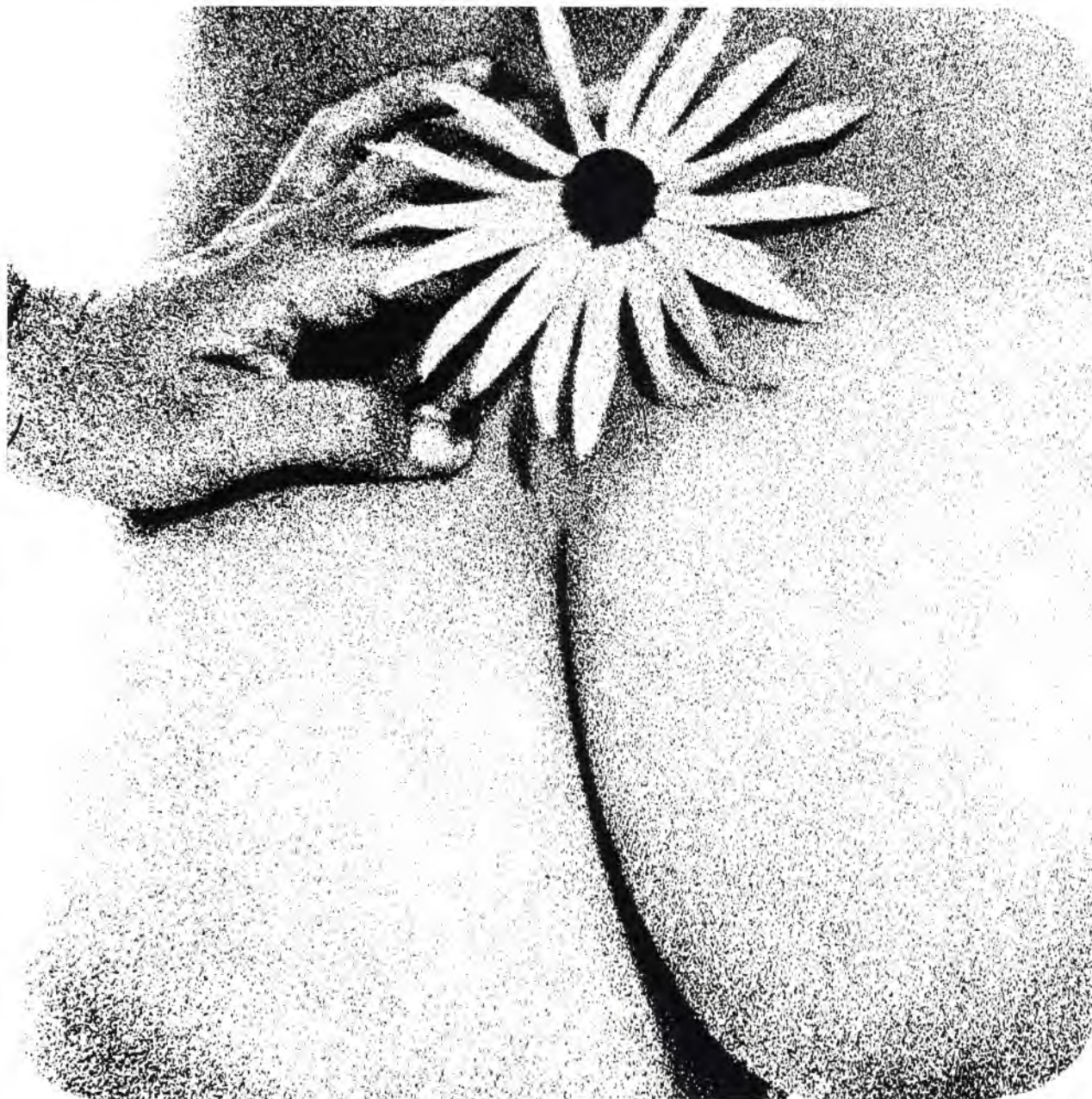
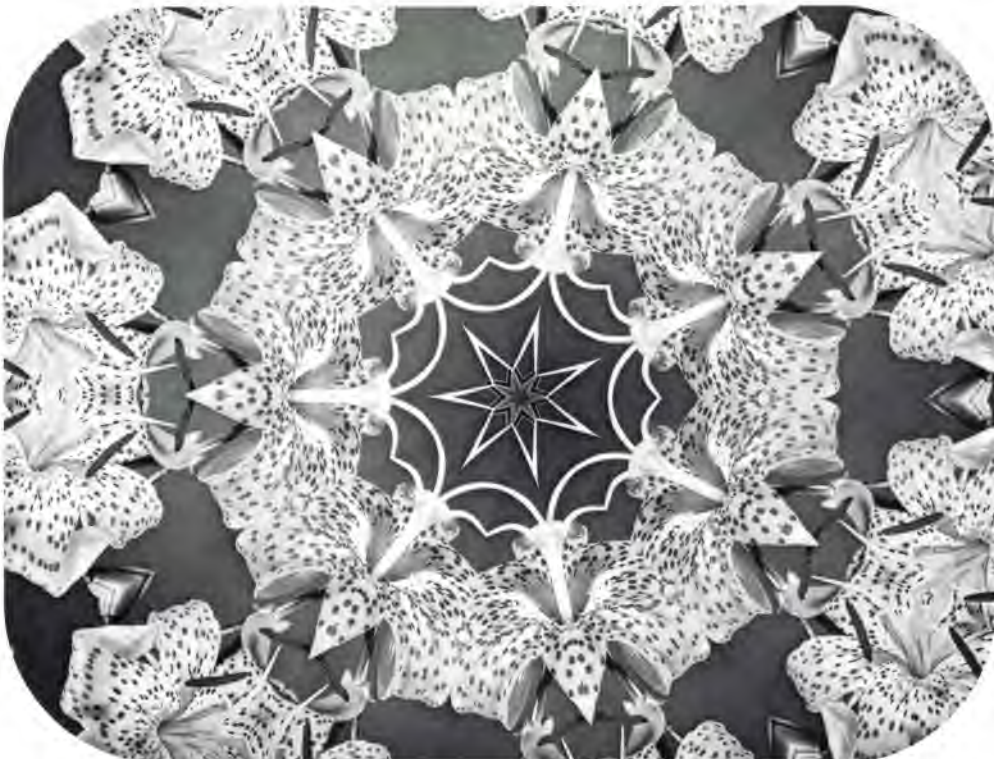
Robert Löbl photographed this sunflower in a nature reserve near Antequera, Spain. Since a light wind was blowing from the nearby sea, he had to select a fairly fast shutter speed to reduce movement, but at the cost of depth of field. 5×7 inch Super Technika, Agfachrome 50 S.

Colour page 18:

Red poppy, taken by Klaus Hackenberg, Lauffen am Neckar. 5×7 inch Linhof Super Technika, Kodak Ektachrome sheet film.

Colour photo right:

Rebutia miniscula. The colour tones in this photo are more "artistic" than normally found in straightforward scientific photography. With the aid of his large-format view camera, the author has tried to follow the rules of good composition and go one stage further than merely recording nature. This out-of-the-ordinary shot was taken by the American photographer Emil J. Javorsky in the Argentine, 4×5 inch Linhof Technika, $\frac{1}{125}$ sec. at f 16 on Kodak Ektachrome.



Top:

"Blumenspiel" taken by Friedrich Bormann, Alsbach. Kaleidoscopic multiplication of one flower led to this composition. We regretted the decision to print it "only" in black-and-white, since much of the picture's effect was due to the dominant red hue.

Black-and-white photo, page 19:

An interesting montage taken by Christian Koch, Nuremberg.

Below:

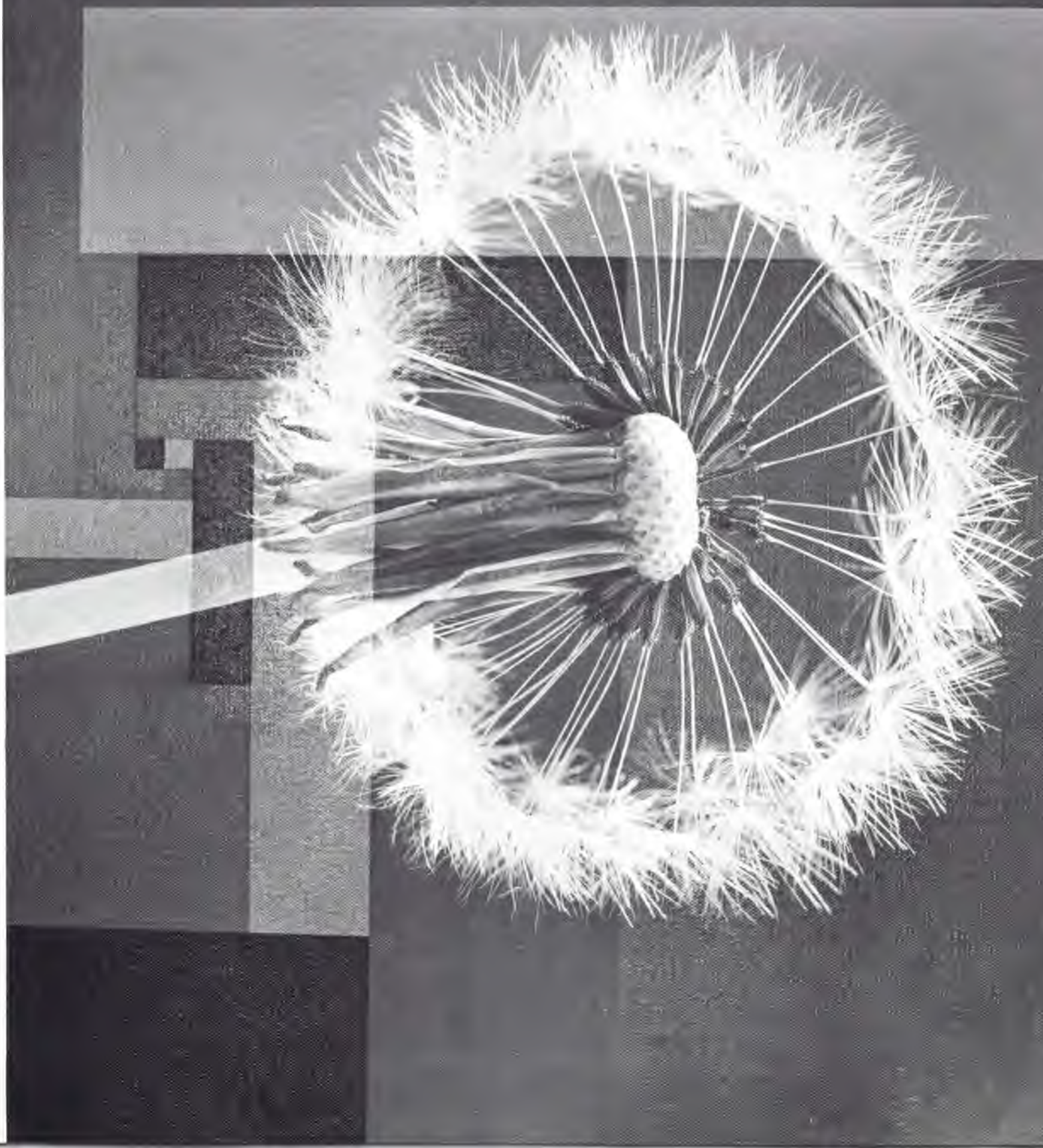
"Marguerite" is what Georges Bodmer of Zurich entitled his coarse grain, lith film composition which he created as a piece of personal publicity. This is another way of interpreting flowers!











New aspects of

by Hans Bortsch

Part 2: Processing the positive

colour technology

One requires astonishingly little space for a properly equipped, modern colour darkroom. All those trays are a thing of the past, and even for black-and-white work the increasing popularity of plastic-coated papers has made dish-development obsolete. In view of the extremely short processing times, it will probably not take very long before one only has to fall back on trays in special cases. Modern enlargers with the diffuse-light type of colour head are just as suitable for black-and-white work as conventional apparatus with a condenser system—as soon as the filters have been swung out of the light path. It is therefore no longer necessary to consider setting up separate work places for b/w and colour when equipping a new darkroom.

The difference involved in fitting out a modest amateur darkroom and a computer-controlled commercial lab are so enormous that it is necessary, for the sake of the present discussion, to limit our horizons to the needs of an average IPT reader. That is to say, we are thinking of a more-or-less conveniently-equipped, medium-sized lab for individual processing procedures.

In a number of photo publications one often reads that for converting a darkroom for colour printing one needs no more than a set of colour filters, a good thermometer, a special safelight filter, etc. This is simply not true, since even if an amateur is prepared to start in this fashion, he would soon be exasperated by the inconsistency of the results. Before going into the

relative importance of various items of equipment. Attention should be drawn to the significant advances made possible by the introduction of plastic-coated paper. It was this innovation which actually made all the other little conveniences feasible in the first place. Today it is possible to inspect the dry print or test strip after only a few minutes. Auxiliary apparatus can likewise be calibrated for a particular paper/developer combination, so that working methods can soon be carried out almost automatically. Those persons who are not in a position to acquire all the manifold blessings of modern darkroom technology at once, can still set out with every hope of success—provided the sequence of priorities is observed.

One can get along without a colour-mixing head, but it is essential to possess a developing drum or processing machine. Here we find quite a variety of apparatus on the market, ranging from a simple drum to be rolled to and fro on an even surface to the punched-card-controlled processor. Both of these extremes lie outside the limits which have been set here. The minimum type of processing arrangement must incorporate a motor-driven drum, preferably running in a thermostatically-controlled water jacket. A popular choice in this category (at present) is the Jobo Colordrum with agitator CP 4100 for enlargements up to 16×20 inch or the more expensive Wilkinson processor for up to 20×24 inch, resp., 24×30 inch.

With the aid of either of these two apparatuses it is perfectly possible to get

professionally satisfying results and keep chemical consumption down to very reasonable limits. Nor are they expensive to buy. It is even a worthwhile proposition to have one of these around when other, large-capacity machines are available so that the latter do not have to be set in motion or blocked for the sake of a few non-routine prints.

In view of the wide variety of processing machines on the market, especially the larger types, there is little point in giving preference here to one or two particular models. The use of a processing drum or machine does away with the previous necessity for darkroom illumination. Yet, it is possible to employ a special kind of safelight which gives much greater illumination than the notorious dark green filters still found in use. The Durst "Sanat" safelight employs a sodium vapour lamp and a special narrow-band filter which has no effect on colour emulsions provided the minimum distance and other instructions are followed. The actual illumination level we perceive is almost as high as that we have become accustomed to expect from modern b/w safelights.

The job of loading the tanks, drums or processing machine is so greatly facilitated in the dark that one might well decide to give the priority to such a sodium lamp over the more obvious choice of a colour head for an existing enlarger.

Anyone who intends, however, to print from colour negatives on a regular basis will hardly get round the necessity of buying a colour head. One day he will find the

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New aspects of colour technology

juggling with flimsy colour filters and the accompanying calculations such a bore that he will decide the next acquisition is to be a colour head. Furthermore, the majority of colour heads now offer the advantage that the built-in filters will not fade even after prolonged use, so that consistent results are guaranteed. Since, as already mentioned, it is recommended to print with a diffuse light source (i. e. without condensers), one must make sure that the basic illumination level is sufficiently high in order to keep the exposure times down to a reasonable range at high enlargement ratios, so that one does not find reciprocity failure adversely affecting the results. This is of particular importance when printing transparencies directly onto reversal paper. The watt-rating of a particular quartz halogen lamp is no definite guarantee that sufficient light will arrive at the easel. One should not buy a colour head of below 200-watt capacity without checking up on the average exposure time at the highest desired degree of enlargement and, if necessary, for the least sensitive paper (such as Cibachrome). A further criterion for the efficiency of an enlarger is the evenness of the illumination falling on the easel. The same applies to the even distribution of the filtration over the negative stage, irrespective of how far the individual filters are inserted into the path of the light rays. The uniformity can be tested with the aid of an exposure meter, respectively, a colour analyser with a spot probe.

Additional features such as automatic focusing or the possibility to swing all the filters aside without upsetting a previously selected filter combination may add to the convenience of operation, but they are of no significance as far as the quality of the final enlargement are concerned. It need hardly be mentioned that, especially for colour work, only high-quality enlarging lenses should be used. There is little point in being content with using a lens which does not match the sharpness of one's best taking-lens for the camera. Utmost care must be taken in focusing the image on the easel. For this purpose one should use a focus-finder of at least 10× mag. and, if the negative or transparency is not held between glass, the focus should be checked at two different points about a third of the way in from the edge of the image.

A useful piece of equipment for any darkroom is, without doubt, a colour analyser. Although opinions about the expediency of such an apparatus differ, even amongst lab experts, it is absolutely certain that correct use of the right ana-

lyser can greatly simplify matters in the darkroom.

Before going into the subject of analysers in greater detail, there is one most useful and inexpensive aid which is worth mentioning. It is the "Simma-dot" filter/exposure calculator set which functions according to the subtractive method and consists of the Simma-dot diffuser clamp, dot chart and grey comparator chart. The Simma-dot calculator is placed over a piece of 4×5 in. colour paper and exposed. After the test print is dry, one can tell, according to the location of the neutral grey dot, on the chart, what the correct filtration and exposure should be. This astonishingly simple and reliable method takes all the variable factors into account so that quite often only one test strip is necessary to obtain a properly filtered and exposed enlargement. Changing from one packet of paper to the next or to a negative of different character is taken into account in the measurement, which is not the case with expensive electronic colour analysers. This is worth noting where a small lab is concerned, since the consistency of the working materials cannot be guaranteed to the same extent as in a large photofinishers where the machines are constantly running. Of course, the filter values read off the dot chart only refer to the set of filters supplied by Simma; they cannot be "transferred" to a Colour head.

If the amount of regular work would seem to justify the purchase of a colour analyser, one should become familiar with the different types, their individual features and how they function in order to avoid disappointments later. One point to observe is that slight but important changes in the density of a particular colour at the higher end of the density scale are not only impossible to detect with the eye but also place very exacting demands on the sensitivity of the analyser. The efficiency can be tested by observing whether the pointer of the meter advances in equal increments at low filter values as well as at high values of one colour (i. e. proportional at both ends of the scale). At

the present time one will only obtain really satisfying results in this respect from apparatus equipped with photomultipliers. Having satisfied oneself that the analyser in question has a sufficiently fine colour response as described, there are still other conditions which it must fulfil. It can be assumed that even meticulous working methods will bring the filter pack, on average, to within ± 10 filter values (Agfa) of the "ideal" filter combination. The final filtration can often only be based on a visual inspection of the dry test strip.

It is important in measurement technology to know that it is insufficient to merely take readings of the three colour densities. Since the orange colour of the mask is more in evidence in the underexposed portions of the negative, we must always select, for a reliable measurement, areas of about equal density, i. e. the average grey value of a new negative must be compared with a grey step of equal density in the master negative. In large-format photography it has proved most practical to include a neutral step wedge at the extreme edge of the picture which is then taken as a basis for the measurement at the printing stage. It must be illuminated, however, by the same quantity and quality of light as the main part of the motif. In the case of roll film or 35 mm film it is only necessary to include such a step wedge in the first exposure of a series.

A solution of equal validity is a light measurement taken through a diffusing dome on the camera lens. The question whether one should take an integral, partially integral or spot reading then becomes of no significance. A precondition is, however, an apparatus which permits spot measurement in order to be able to seek out areas of equal density on adjusting for balance. In those instances where one has to make an enlargement from a negative without a step wedge it is still possible to arrive at usable results so long as portions of similar colour and approximate relative density are selected for the measurement. One suitable reference in this category is the skin, although a subdivision into fair complexion, normal and dark-tanned will prove necessary. The colour analyser should be additionally programmed for, resp., with these values. If faces are not to be found in the negative, one will be glad to have an additional storage facility in the analyser (usually in the form of a numerical combination) for an integral measurement. This method is more reliable than many people believe, provided suitable negatives are available for a comparative measurement. Generally, it is a matter of motifs in which the





distribution of different colours all over the picture area is sufficiently even to result, in the final sum, in a more or less neutral shade of grey. When applied with reason, such a method of measuring also leads to a suggested filtration which only needs to be backed up by a single test strip in most cases before the perfect filtration is certain.

This section on the techniques of analysing colour negatives serves to show, as is the case with camera techniques, just how problematical it is to line up objectively measured results with subjective feelings about colour in general. Just as it would be ridiculous to try and balance the light with the aid of a colour temperature meter and filter gels for every subject shot on reversal film, there is equally little point in attempting to reproduce every time in the print the exact lighting situation which prevailed on location. In spite of the enormous technical progress which has been made recently, there is, fortunately, still plenty of scope for one of the most fascinating aspects of photography: the ability to employ all the technical refinements for the sake of expressing one's visual impressions in a subjective form.

What basic knowledge can be expected of persons seriously considering entering the field of colour processing?

When one may assume that the procedure carried out in a b/w darkroom is thoroughly familiar, then there are the following further points to be added:

1. An understanding of "colour" as a phenomenon of light waves.
2. The influencing of colours through altering the quality of the incident light.
3. The working procedure associated with the new colour processes and materials.

With ref. to 1.

Visible light makes up only a relatively small band of the extensive range of electro-magnetic waves. This visible band is bordered on the one side by ultra-violet rays which, although they may not be perceived by the eye, do have a certain, varying effect on photographic emulsions. Apart from the pure, primary colours inherent in the spectrum, practical photography is also very much concerned with the so-called "non-colours" white, grey and black.

The *spectral colours* are revealed when a beam of white light is passed through a prism; on dispersal, the shorter wave lengths are refracted most acutely, whereas the longer wave lengths are bent to a lesser degree.

Coloured bodies result through the reflection of colour from an object which itself is not emitting any light rays. The object appears to have colour through the fact that it has the capacity to absorb certain hues and reflect others. As a matter of principle an object can *only* reflect those colours which have been emitted from the light source.

Colour filters are used to modify the colour temperature of the light falling on the subject or passing through the camera or enlarger lens.

With ref. to 2.

Additive synthesis is the formation of colour by mixing light of two or more colours. Any colour may be matched in hue by mixing light of the three primary colours in the proper proportions. Equal proportions of the three primary colours result in white.

Subtractive synthesis is the formation of colour by removing from a path of white light varying proportions of one or more spectral components by interposing coloured filters. As the light passes through the filters, specific colours are absorbed, hence the name "subtractive filtration". Yellow absorbs blue but permits red and green to pass. Magenta absorbs green but permits blue and red to pass, and cyan absorbs red permitting blue and green to pass through. When two subtractive filters are laid together, only a third of the spectrum is allowed to pass. From combinations of this nature the following effects can be achieved:

Yellow + magenta absorb blue and green but let red pass. Yellow + cyan absorb blue and red but let green pass. Magenta + cyan absorb green and red but let blue through. Therefore, subtractive synthesis is the only method which enables one to carry out correct filtration in *one* exposure—either with a camera or an enlarger.

With ref. to 3.

Irrespective of how sophisticated the darkroom equipment is, one must first of all find out the correct basic exposure and filtration for a particular combination of master negative and chemical process. The best way to do this is to prepare test strips, and for the uninitiated person who has no idea where to start his test series one can recommend the Simmadot FS 2 calculator set already mentioned, since even a "wild shot" will provide a pretty good idea of what the filtration/exposure should be for a second attempt. Many text books on darkroom practice recommend that one should make an extensive

exposure and filter test series. There is probably much to be said for this method, but in daily practice it can be very time consuming. If negative film is stored and used according to the makers instructions, there will only be appreciable differences when changing over from one make of film to another on account of the different dyes and density of the mask. It would be going too far to quote data based on past experience, since such information may no longer be valid in the future and since there is no standardization in filter values. Nevertheless, the following is worth mentioning: in the case of the negative positive process the combination is practically always made up of yellow and magenta filters, and for the positive/positive process fairly strong cyan filtration is needed.

In the negative/positive process the following principles should be observed:

1. A colour bias can only be counteracted by employing an additional filter of the same hue.
2. Desired colours which are not to be found in the filter set can only be obtained by combining two filters of different colours, e. g. one gets blue from a little more magenta in relation to cyan.
3. Filters call for an increase in exposure in relation to their density.
4. Any specific colour nuance can be achieved by combining two primary colours. A third colour merely introduces a grey value and thus reduces the transparency of the filter pack unnecessarily.
5. Should one find that, on arriving at a neutral colour balance, a particular filter pack *does* contain three colours, one can reduce the overall density by simply removing the filter with the lowest filter value, for example:

	yellow	magenta	cyan
Original	30	70	10
filtration	—10	—10	—10
	20	60	—

In the positive/positive process there are several deviations from the above:

1. A colour bias can only be removed by using complementary filters.
2. An increase in exposure time results in lighter pictures and vice versa. (Also in contrast to b/w photography.)

The use of colour analysers is, of course, possible in both the negative/positive and the positive/positive processes, but they are not at all necessary in the latter.

Linhof



A comprehensive range of tripods with universal application. LINHOF tripods for amateurs and professionals alike, for stills, motion pictures and video.



LINHOF 220 and 220 RS, the hand cameras for candid action in the quality $2\frac{1}{4} \times 2\frac{3}{4}$ inch format. Perfect styling and utmost ease of operation.



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The following is a survey of the most important current developing processes:

Agfa-Gevaert

The entire range of possible processes is best obtained from the extensive technical literature published by Agfa; here it is most appropriate to pick out only one variant which is of greatest use in a fairly small lab where individual working methods with drums or tanks and plastic-coated papers are important.

Stage	42 °C	25 °C
Pre-wetting	1 min.	1 min.
Developer 85 CD	1 ³ / ₄	5
Stop bath	1 ¹ / ₂	2
Wash	1 ¹ / ₂	2
Bleach/fix	1+2	4
Wash	2	3
Final bath 85 FI	1	2

The kit for this process is available to make up 1 litre of solution.

Kodak

All the RC papers can be processed in drums with Ektaprint 300 chemistry at 38 °C.

Pre-wetting	1 min.
Developing	2 min.
Stop bath	1 ¹ / ₂ min.
Wash	1 ¹ / ₂ min.
Stabilization	1 min.

The smallest size of chemical pack is for making up 3.8 litre (1 US gal.).

Kodak Ektachrome 14 RC in Kodak chemicals at 30 °C

Pre-wetting	1 min.
First developer	3 ¹ / ₂ min.
Stop/hardener	1 ¹ / ₄ min.
Wash	2 min.
Second exposure	
Colour developer	3 ¹ / ₂ min.
Bleach/fixer	3 ¹ / ₂ min.
Final wash	3 min.

Kodak Ektachrome 14 RC in Tetenal high-speed chemicals at 40 °C

Pre-wetting	1 ¹ / ₂ min.
First developer	1 ¹ / ₂ min.
Stop/hardener	1 ¹ / ₂ min.
Wash	1 min.
Second exposure	
Colour developer	2 min.
Bleach/fixer	2 min.
Final wash	3 min.

Tetenal

Can supply high-speed kits (PA and PK) for 1 or 5-litre solutions to process Kodak and Agfa PC papers. They consist of merely two baths: colour developer and bleach bath. It has proved advisable, however, that an intermediate rinse in a 1% acetic acid bath gives more reliable results, especially when making large-format prints. (Duration of 1/2 min. is sufficient). The processes may take place at temperatures ranging from 30 to 42 °C.

Positive/positive process for opaque prints.

Cibachrome P 18

Direct printing from colour transparencies. Liquid concentrates for making up 25 litres (6.6 US gals.). (Possible to make up smaller amounts of working solution). Chromolytic process (dye-destruction) affording excellent rendition of detail and resistance to fading.

Process temperature:	30 °C
Pre-wetting 1	1 min.
Development	3 min.
Wash	1 min.
Bleach/fix	3 min.
Final wash	5 min.

Second (reversal) exposure and UV-stabilization bath are not necessary.

Cibachrome P 10

Kit for 2 litres of solution. Cibachrome has a plastic base and is only available in 8×10 in. format at present, later in larger sizes.

Stages	20 °C	24 °C	28 °C
Development	2 ¹ / ₂	2	1 ¹ / ₂
Bleaching	4 ¹ / ₂	4	3 ¹ / ₂
Fixing	3 ¹ / ₂	3	2 ¹ / ₂
Wash	3 ¹ / ₂	3	2 ¹ / ₂

The purpose of selecting these processes is to show, in the first place the beginner, just how relatively simple processing technology has become in recent years. Provided one specializes in one or two processes and does not capitulate after the first attempt, one will soon be able to confirm that the step from black-and-white darkroom practice to colour is not all that large any more. A final word of advice though: those just setting out in this field would do well to gain initial experience in b/w techniques, since even today basics are more easily grasped in this medium.



PHOTOGRAPHY IN INDUSTRY

is truly an encyclopaedia for the photographer who wants to succeed in the extensive industrial field. It shows you the way to improve your present techniques, gives you guidance for tackling the most complex assignments.

It is brimful of facts about every aspect of this most important branch of applied photography. Comprehensive individual chapters cover the photography of entire plants, machines and machine parts, exploded views, macrophotography, finished products, planning and equipment of a complete inplant photographic department, as well as the choice of photographic materials.

Innumerable suggestions, special tricks, experiments and short-cuts have been gathered in this outstanding volume.

272 pages – 350 illustrations – many full-color pages – charts, diagrams, etc. 9¹/₂" × 11" in size. Four-color laminated hard cover.

Please use the enclosed book order card, last pages.

At the foot of the Sierra Nevada stands, alone and humble, a small green tent. It is hardly 6½ ft. long and about 4 ft. wide. The owner of this tent is over 7 ft. tall, 23 years of age and called Stuart Soulé.

I see him working near his tent on some apparatus or other and approach to investigate. Still some distance off, I recognize the object to be a "Komet", a type of man-bearing kite.

So this is the person I observed the day before hovering between the clouds; at a great height I had noticed how a triangular object moved in slow, majestic curves down from the clouds. It was so high that it was difficult to recognize that a human being was attached. The object appeared more like a large bird with white, outstretched wings which had ventured, by chance, into the clouds hanging around the Sierra Nevada. So here he is, standing on his feet firmly on the earth again, preparing his contraption for the next flight.

"I saw you up there in the clouds yesterday, where did you take off?" "From La Veleta", he said. "Do you really jump from the peak of La Veleta?" I asked in surprise. "Yes, from the very top, that is just the right place for me". It should be mentioned that La Veleta is the highest

peak of the Sierra Nevada, towering up for a good 11,150 ft. and plunging down abruptly on the northern side. "When are you jumping off again?" I wanted to know. "I am just getting my Komet ready for transport and shall be going up again in a few minutes". "How many flights do you make a day? How long have you been doing this?" I queried. "I've been in the Sierra Nevada for about two weeks and get in, perhaps, about six or seven flights a day", he replied.

Our "bird man" has put on a face mask which protects him from the cold wind.

Black-and-white photo bottom:

Transport to the top.

Colour photos right:

Top: A dream of mankind is fulfilled. Flying with "dragons" has become an increasingly popular sport in the past couple of years.

Below: Unusual luck, patience and photographic skill are packed in this shot taken by Wsewolod Gontscharoff (Central Color), Garmisch-Partenkirchen. He managed to capture his "Batman" so that the subject filled the full format of his 4×5 in. Technika. Other pictures were also taken by the author.

250 mm f 5.5 Schneider Tele-Artar in Compur electronic shutter, Kodak Ektachrome daylight.

I ask him whether the strong wind does not present a considerable danger. "Of course", he replied, "especially on take off, since the head wind could hurl me back on to the cliffs. Today everything should be all right, though, since there is hardly any wind." Looking down into the valley, he once again checks the wind. With the Komet, which has a small seat rather like a bicycle, he advances to the edge of the precipice. He then retreats ten paces and, with a vigorous dash, jumps off the edge.

It was a breathtaking moment. One could hardly believe that these two fairly small wings bear the weight and save the life of a human being. Gliding like a seagull, he once again left the highest peak in Spain and, after three quarters of an hour, landed at the foot of the Sierra Nevada on a plateau where a few modern hotels have recently been built.

Our friend, however, is a man of sport. He prefers his tent to a hotel. His favourite means of transport is his Komet; otherwise he goes on foot, pulling behind him a small, two-wheeled cart in which he transports his gliding equipment, his tent and personal belongings. He has tramped through many countries pulling all of this with him.

Who's afraid of dragons?







CATALOGUE PHOTOGRAPHY



Colour page, left, top:

The greatest impression of depth can best be obtained with the aid of a view camera and a knowledge of the Scheimpflug law. Rolf Noack, Oberursel in Taunus, has succeeded here to a remarkable degree. The 5 x 7 inch transparency served as the original for printing the cover of an expensive catalogue of Oriental carpets.

Below: Wrought iron. The Munich photographer Gerhard Arand is a specialist in this rather unusual and tricky field. His catalogue photos are evidence



of his skill in effectively lighting this subject and carefully balancing the arrangement on his focusing screen.

Black-and-white pictures:

These three examples point out three different approaches in catalogue style. On the left, the French photographer Paul Genest employed a dummy motorcycle (made of cardboard) so effectively that the uninitiated are hardly likely to recognize the trick. A young model was included in the scene to add life and to enhance the realism.



Centre: A classic example of genuine, solid catalogue photography. Expensive objects are taken in a straightforward, fitting manner, since this is the most certain way of appealing to the target group concerned.

Photo: Robert Löbl, Bad Tölz-Ellbach:

Right: A definitely matter-of-fact presentation with a simple background. Yet, the picture does not fail to please on account of the clever "staggered" arrangement.

Photo: Alexej Ruegger, Zurich. Sinar camera with 240-mm Symmar, Ektachrome sheet film.

Illustrated catalogues have become an accepted means of merchandising in the modern advertising world. Mail order houses such as Sears & Roebuck in the United States, Quelle in Germany or La Redoute in France have, indeed, a large and exclusive demand for such photography. Many photo studios, e. g. Harry Langdon in America or Paul Genest in

Paris have specialized in this field. In keeping with their nature, such illustrations have their limitations as far as aesthetic or creative considerations are concerned. The client wishes, in the first place, to see his goods presented in as favourable a light as possible; this means shown attractively, with sharp details and, if possible, against a fitting back-

ground. So, right from the outset, the photographer has not got much scope to "compose and create". Nevertheless, there are some good photographers who still manage to turn out interesting pictures for catalogues; their skill is still evident, even although they have been asked for a straightforward illustration of an everyday product.

Top: There is no reason why catalogue illustrations should not be arranged and photographed in an attractive, artistic fashion, as this study by Paul Genest proves.

It is such photographers who are then very much in demand in this field and fear no competition. One can easily recognize their "handwriting". They tend to regard catalogue photography less as a necessary evil which merely supplies them with their daily bread and butter but rather as a challenge to develop new ideas and put them into practice.

About the techniques involved in the production of such illustrations there is



Below: A spartanic way of photographing a precious treasure: it appears as if the photographer, Harry Langdon, was not allowed to touch the chess set!

Right side: photo W. Unger, Germany.
In Europe known as a special food-photographer

not all that much to be said. Naturally, the principles which apply to still-life, photomacrography, etc. should be observed here. A lengthy conversation between the client and the photographer is likely to be of greater importance. The latter will learn exactly how the product is to appear, to whom it is to appeal, etc., and can then proceed to interpret these wishes into photographic terms.

D. Nasser





Those little details are worthy of your attention

The daily stress to which photographers, amongst others, are subjected and the drudge of having to earn one's living, often leave the photographer indifferent when he hurries by an interesting motif on his way to work. Since this kind of aesthetic, incidental picture is seldom coupled with a lucrative assignment, he does not consider it worth while stopping and getting out his equipment. Yet, photography draws its inspiration from its artistically-inclined members. They are the people who will continue to develop their skill, since here it is often a matter of genuine art. It is a well-known fact that art is a very vital element in any culture. What kind of subjects are actually referred to in this context?

Below: "Bottles".
Taken by Hans Kanne, Darmstadt.
Would this not serve as a poster on the subject of
"minorities"?

Colour page

Top left: "Dog at the window".
What a delightful snapshot!
Photo: Horst Riehl, Frankfurt am Main.

Top centre: "Paper basket".
Hardly a coincidence.
Photo: Werner Unger, Cologne.

Top right: "Curiosity".
Taken by Hans Demmler, Memmingen.

Below: "After the washing".
Taken by Klaus-Dieter Krömer, Cologne.

Colour page 36:
Internat.-Photo-Art-Service, USA

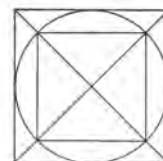
Harold Mante, who is probably the initiator of the "detailed shot", says he looks for apparently insignificant objects and tries to work them into a graphically-strong composition, e. g. brightly coloured or extremely rusty letter boxes, brilliant painted window shutters which stand out clearly against their surroundings, a forlorn and battered milk can. But even humorous situations, little excerpts from life, can have a particular documentary effect. The examples accompanying this short contribution are only intended to serve as a suggestion, since especially this field must be abounding in possibilities. The only requisites are: an observant eye and a ready camera.







technical news



Smallest LINHOF Camera with a true medium-size format: "220 PL"

In our day and age of strong specialization, the success of an assignment almost invariably depends on a special tool. Only in photography this fact is not always taken seriously. For example in aerial oblique photography, cameras are at times employed which have neither been designed for the purpose nor are suitable. If, however, such pictures are compared with those taken with special cameras, the great difference in quality becomes apparent immediately.

This, however, would only be one side of the medal! Important for achieving optimum results is the unproblematical handling of the camera. In this connection no compromises whatever should and must be entered into!

An aerial camera must be clearly arranged in its functions, handy, quick to operate, reliable and small. Considerably higher demands are made on the optical system unlike with normal photographic apparatus. For the perfect sighting of the aerial photographic subject, the camera must be equipped with an appropriate finder. In this connection it must not be forgotten that range finder or reflex finder are unnecessary with an aerial camera, merely disturb and generally considerably render more difficult the determination of the selected area.

With regard to all properties with which an ideal aerial photographic apparatus must be provided, the smallest aerial camera with a true medium-size format, the "220 PL", originated with LINHOF.

The efficient "ideal format" of 56×72 mm introduced by LINHOF years ago permits aerial oblique pictures with very good reproduction of detail and facility for enlargement, in black-and-white or colour.

With one loading of 120 or 220 roll film, either 10 or 20 exposures can be made in rapid sequence



with the new "220 PL". The fast-action film advance lever here caters for the film transport and the cocking of the shutter. As the lens, the proved LINHOF Techni-kar 3.5/95 mm, was retained.

High-speed-loading roll film cassettes prevent all loss of time during the film change. A sport's finder and the adjustable moulded handle fitted at the side complete the ease of handling and the speed of this camera.

Although the LINHOF 220 PL had been originally thought of as an aerial camera, numerous enquiries at the works prove that this apparatus may also be applied without hesitation in other fields of photography, such as:

Landscape, sports, alpine climbing and news reporting.

Specialization of the photographic apparatus does not implicitly signify one-sidedness!

Technical data of the LINHOF 220 PL:

Camera for the ideal format of 56×72 mm, convertible to 120 to 220 roll film for 10 and 20 exposures respectively, sport's safety finder, fast-action film advance lever and simultaneous shutter cocking, double-exposure prevention, ready indicator, anatomic adjustable moulded handle with carrying strap, lens LINHOF Techni-kar 1:3.5/95 mm, synchro compur shutter B, 1—1/500 sec., XMV, depth of focus indicator, high-speed loading roll film cassettes, black matt enamel finish.

New budget-priced LINHOF compact enlarger 9 × 12 cm/24 × 36 mm

The new LINHOF Compact Enlarger 9×12/4×5 in. was created for discriminating photographic amateurs who know how to appreciate the advantages of adjustable large and mediumsize format cameras, as well as for small graphic art works, professional laboratories, scientific institutes and schools. In addition to its favourable price, this enlarger exhibits a series of technical special features which distinguish it from many other comparable pieces of apparatus.

— The length of the square-section column with screw-attached gear rack and height scale is 122 cm and permits enlargements from all negative sizes—miniature format up to 4×5 in.—with a correspondingly adapted lens up to the size of the baseboard of 50×60 cm. Maximum enlargement factor with standard lens f: 150 mm is 7.2× from an

optional negative size. Over-size enlargements by means of floor projection with the aid of the rotatable column mount. Due to the long extension of 310 mm, up to 3 times linear reductions are possible with interchangeable lenses without changing of tubes.

— Effortless level adjustment of the apparatus head by means of a crank mechanism with recoil brake.

— The overhang of the apparatus head (distance from the column) can be adjusted in three positions, the carrier being provided with an adjusting device for both planes.



— Universal double condenser for lenses with f = 80 mm, 100 mm and 150 mm. With the use of a supplementary condenser also for 60 mm focal distance.

— Universal film holder for roll films, cut film and film strips, with a novel cassette also expandable for register operations during enlarging and

copying. Holders for slide mounts 5×5, 7×7 and 8.5×8.5 cm as well as for gelatine filters 70 mm for the direct enlargement of colour slides.

- Parallel lifting of the condenser attachment during film transport by means of cam and precision dovetail guide.
- Lens mounted on LINHOF 9×12 panels, suitable for quick-changeover device.
- Focussing by way of non-slip knob and drive by rack and pinion, additionally with clamping facility.

The enlarger operates on direct transmission of light by means of a 150-watt opal lamp with centering facility and variable distance setting. As an accessory a copying illumination set DIN A2/2000 watts, switch-selected in two steps, is available.

New catalog: complete range of LINHOF Precision Tripods

Every photographer—whether an amateur or a professional—is well advised to study this complete range on offer by LINHOF before purchasing a tripod. "To build a perfect tripod for each application" has always been the motto of the world-renowned camera works. It is an established fact that only with a high-quality, really rigid tripod can the possibilities and the performance reserves of modern cameras and lenses be fully exhausted.

The reader of the catalog is given a revealing survey regarding the 40 different LINHOF tripods and 20 tripods heads at present available.

The range on offer is all-embracing and thus meets any requirement imaginable whether in the field of photography, movie-making or video. The selection comprises easily transportable amateur and professional tripods, studio tripods, lamp tripods, table clamps and table columns, copying lighting equipment, tripod trolleys, ball heads and patent heads, video tilting tops and fluid-brake movie tilting tops.

A copious range of accessories ensures within the scope of the LINHOF tripod system all means for expansion over the years to come.

Upon enquiry from the manufacturer, the two-colour "LINHOF Precision Tripod Catalog" will be forwarded.

Linhof Monopod for Still and Cine Photography

No trouble to carry around is this handy monopod for amateur photographers and movie-makers made by Linhof. The leg is of four sections and incorporates a fold-down camera mounting plate. By means of the revolving ring it is possible to clamp the monopod at any height between 17 and 61 in.



Since the camera mounting plate can be swung down through 90°, there is no longer any reason to be confined to horizontal shots with a monopod. A rubber tip ensures that the foot grips on any surface.

Linhof Twin-Shank Tripod with Levelling Mount

This new model from Linhof is a practical, light and yet extremely rigid tripod which can be put to equally good use in the fields of still photography, cine, video and television. This versatility is due to the fact that the top casting of the tripod is designed as a spherical "ball-and-socket-type" mount which can be levelled off and accepts all the tripod heads with the



90-mm base plate (also 70 mm with reduction ring), the large-gear centerpost as well as the Cinematic Panhead I or Two-Way Gyro Head. When using the latter two heads, it is possible to correct a 15°-bias in any direction.

Absolute stability is ensured through the double shanks made of sectional aluminium, the rapid eccentric clamps and the rubber-padded, resp., steel-tipped feet. The leg struts may be detached.

As in the case of all Linhof tripods, the aluminium parts have been given an anodized finish, making them highly resistant to scratching or tarnishing.

Technical data

Height: 81/186 cm (31.8/73 in.)
Weight: 3200 grams/7 lb.
Maximum permissible camera weight: about 15 kilo/33 lb.
Accessories: tripod case

The ideal combination: LINHOF professional levelling tripod and Cinematic II

Only in unavoidable situations—and even then under protest—will experienced movie and TV operators do without a tripod. It is indeed an all too well known fact that pans will only exhibit the necessary freedom from jerks when projected if they have been accomplished with the aid of a rigid tripod. Equally important in this connection is a very good tripod head, with which the movie sequences can be carried out about both trunnions with a perfectly constant speed.

As an ideal combination in this respect the LINHOF professional levelling tripod with the Cinematic II tilting head presents itself. The tripod corresponds in its construction, quality, form, weight and stability to the highest professional requirements.

The Cinematic II permits filming absolutely free from jerks not only with panoramic panning but also with tilting movements of the camera in conjunction with a previously adjustable precise delay. And even more: due to the combination of both rotary motions, even diagonal pans can be mastered with ease.

As an additional advantage the tripod head designed as a spherical mount and the ball-shaped lower part permit an all-round levelling of the movie camera by 15°.

All these properties contribute towards the solution of real professional problems.

Technical data

Professional levelling tripod:

levelling spherical cap, double profile strut with eccentric clamping devices, extension tubes with steel points which can be converted to rubber feet, detachable radial struts, readjustable tripod strut bearings, surface treatment of the duraluminium parts by hard-anodizing, length 155/91 cm, weight 6800 grams.



Accessories: large insert for centerpost gearing, carrying bag.

Cinematic II:

tilting head with adjustable hydraulic delay for both trunnions, additional clamping of both fluid brakes, dust-proof and airtight encapsulation, thus free from maintenance, guide spindle repluggable for right-hand or left-hand operation and tilting-angle adjustment by means of a gearing arrangement.

Versatile applications: LEVELLING TABLE TRIPOD

It is a frequent occurrence in the studio or with outdoor shots that the photographer wishes to make some correction on the model at the last moment and doesn't quite know where to set down his camera. The same applies whenever the photographer is operating with two cameras at the same time: with a very low camera view point or if one has to climb up somewhere high for making the picture, the second camera suspended from the strap will undoubtedly be inconvenient.

A well-known travel photographer revealed to us the method employed by himself in such

situations. It is as simple as it is practical!

Of the two 6×6 cm reflex cameras, one—generally that which is used less—is equipped with a LINHOF levelling table tripod. Since these types of cameras almost all hang with their optical systems pointing downwards from the carrying strap, the small tripod does not disturb at all. When it happens that the camera is to be set down, it will stand perfectly safely with the levelling table tripod on any sort of ground. Yet another advantage: with shots taken near the ground, there is no need for sitting down or shuffling on one's knees for the purpose of achieving an unblurred hold of the camera through movement. By means of the spherical cup with levelling facility of the LINHOF table tripod, the camera can be perfectly aligned and then stands rock-steady during the release just as it is only possible with a tripod. In the same manner time exposures can naturally also be made excellently. Frequently a large and considerably heavier tripod can be avoided by taking recourse to a stone fence, table or wall projection, upon which the table tripod is placed. If the three legs are screwed into the transporting position, the levelling tripod attached to the camera substitutes an additional manipulation.

LINHOF geared centre Video tripod

This new two-section LINHOF video geared centre post tripod has been specially designed for the video field. The well-known double-profile tripod, proved over many years, is equipped with a permanently built-in centre post

with this version, with which the height adjustment is effected by means of a crank arranged below and a central spindle. The mechanism was arranged with a self-locking device, so that the application also of heavy photographic units does not offer any problems.

A 77-mm dia. changeover plate is provided for the camera mounting.

Detachable radial struts (see photograph) on the one hand serve for securing a perfect stand on level ground, on the other hand for compensating unevenness in open ground. A variable increase in the extension of the tripod is obtained with the cam clampings. The tripod struts are provided with rubber feet which can be converted to steel points.

All aluminium parts possess the good surface treatment by hard-anodizing known well with LINHOF.

Technical data

Size: 81/156 cm
Weight: 3600 grams
Accessories: Tripod bag, projector table

New Braun FP 8 is much brighter

The new Braun FP 8 continues the proved series of projectors. Essential innovation in the optical system make it one of the Super-8 projectors with the brightest image on the market. As the first and so far only apparatus, the FP 8 offers an exceptionally small (35 mm dia.) 12 V/100 W cold-light mirror halogen lamp. It not only increases the light output considerably, but also brings along its own—and thus without further adjustment—"condenser" accurately matched with it. The special Vario-S-Travenon f:1.3/16.5—30 mm with partial double-coating is responsible for the image brilliance in all focal length positions.

The practical portable apparatus, incorporating a daylight projection surface in the lid, is a link in the twin-band sound system for the highest demands on quality. The Braun FP 8 is organically prepared for the connection to the pulse control unit Synton FP. For silent film operation too, it offers great operating amenities with an automatic film threading on to the 120-meter wind-on reel, contactor control, anti-interference pushbutton for compensating transport faults due to, for example, damaged per-



forations as well as an automatic switching pause light.

Manufacturer: Braun Aktiengesellschaft, Rüsselsheimer Strasse, D-6000 Frankfurt (Main), West-Germany.

Diaplay AV 500

A new advertising facility for industry, trade and the services trade.

Diaplay AV 500 is a new projector which operates on the moving picture principle. The unit consists of a TV-like back-projection box and a small handy projector. The latter operates with a 35-mm film strip which is glued together at the ends and thus is running continuously.

The areas of application of the Diaplay AV 500 are unlimited: as an eye-catcher in the shopwindow, customer advisory service and advertising in the salesroom or demonstrations at trade fairs. Everywhere where information is to be conveyed, the Diaplay AV 500 is an ideal device. The moving picture excites attention, the projected picture is brilliant and bright even in daylight.

Also of interest is the Diaplay AV 500—Sound. This unit is additionally equipped with a cassette tape for endless sound cassettes and an automatic stop device for the moving picture projector.

An accompanying text or music associated with the pictures is recorded on one track. The other track is impressed with pulses which stop the moving picture projector or allow it to continue running.

With the aid of the new advertising projector 10 pictures per minute, i. e. 600 items of information can be transmitted. Due to the endless loop principle, there are no interruptions in the program sequence.

In view of the fact that the Diaplay AV 500 operates with normal 35 mm film, the production of film strips is uncomplicated. The simplest method: the lettering of perforated transparent film with a felt pen.

Using the photographic method, there are two possibilities: with actions at short notice, special offers, etc., which are only intended to run for one or two days, miniature positive film can be employed directly. If the strip, however, is to run for a longer period, it is advisable to have the slides re-copied by a copying laboratory onto correspondingly hard-wearing material, such as cine material "Eastman Color positive" or "Ansco transparency" material. The length of the strip may comprise 20 to 100 frames of 24×36 mm.

Effect projection

Normally the moving picture projector will be employed together with the TV unit-like projection box. Since, however, the projector can be simply taken from the box, a projection may be made in any manner desired or onto a screen. For the purpose of obtaining a true-sided projection image with wall projection, the lens has merely to be repositioned and the mirror in the optical system plugged into a different socket.



By means of oblique projection, very varied effects can be achieved which are still further amplified by the moving picture. Shopwindow decorations can, for example, be designed more interestingly if a transparency strip is used with alternating coloured panels or patterns and the items on exhibit are then spot-lighted.

Distributors: Kindermann & Co. GmbH, Postfach 28, D-8703 Ochsenfurt, West-Germany.

Title composing unit "Veigel Fotostar"

Many printers, graphic artists, advertising agencies, photographers, etc. require a unit offering all



facilities of title composing and which nevertheless pays for itself rapidly due to a favourable price.

These basic requirements are met with by the Veigel Fotostar:

- the film adapter for 5 cm wide films can be exchanged in a matter of seconds against other type supports, e. g. as a straight edge.
- Distortion device for modification in each direction, built-in on quantity production.
- The working table can be adjusted quickly and accurately within a millimeter; horizontally, vertically, diagonally, for a curved and undulatory composition.
- Super-bright-IQ-lamp for shortest exposures.
- Perfect even illumination, also of largest letters and signs.



- Most up to date electronics. Rugged steel construction of column, working table and unit head ensures long service life. A wealth of accessories: round composition board, reduction device, enlarging device for negatives up to 6×6 cm, foot switch, interchangeable lenses.
- Films with more than 2000 type specimens.

Manufacturer: Veigel Photogeräte GmbH, Postfach 880, D-7140 Ludwigsburg, West-Germany.

Exceptionally budget-priced studio electronic flashlight unit in a compact system of construction

As the British manufacturer assures, "Colorflash 100" costs only approximately half the price of a normal studio unit. The weight of the "Colorflash 100" too, is astonishingly low with its 2.25 kilos.

Specification

Flash duration: $\frac{1}{1000}$ sec.
Recycling time: 2 sec.



Reflector diameter: 210 mm
Range light for focusing in poor light: 200 W
Guide number approx.: 36

Distributors: Horst von Bröckel KG., Alsterdorferstrasse 2a, D-2000 Hamburg 60, West-Germany.

Zenza Bronica EC-TL with fully automatic exposure control

The Zenza Bronica EC-TL is the first 6×6 cm reflex camera with an automatic exposure control integrated in the camera body. In this manner the proved follow-up principle in conjunction with the TTI attachment of the associated model "EC" was systematically further developed. Due to the integration of the automatic system within the body, the free choice of the optimum finder is fully maintained.

Mode of operation of the system: preselection of the working aperture, after pressing the release, the measurement of the image-effective light occurs through the



stopped-down lens, the corresponding time is selected steplessly and exposed, it is indicated on the dial by light-emitting diodes.

Other technical data and system accessories the same as with the well-known model "EC" which is still part of the range.

Also newly available: Polaroid back part for EC/EC-TL, lens Nikkor 2.8/75 mm (HC) multicoated.

New Canon product: Super-8-Camera 514 XL

Following the 310 XL and the 512 XL, the third camera with the marking (existing/light) has come on the market: the Canon 514 XL which will permit shooting even if lighting conditions are very poor.

The performance of the camera is proved by the following technical data.



- Five-element variable focus lens 1:1.4/9—45 mm; 13 lenses in 10 components. Shortest focusing distance 1.2 meter. Two macro ranges: following the shortest and longest focal length. Motor-driven focal length adjustment with the camera running. Filter diameter 43 mm.
 - Bright and parallax-free reflex finder: split-field range finder, indicator for working aperture, faulty exposure visual signal, film advance, battery test lamp, diopter setting from —4 up to +3 diopters with built-in eye cap.
 - Light measurement through the lens with a CdS photoresistor. Smallest stop is 32. For use in conjunction with films having speeds of 15/17—21/23—23/25 DIN. Built-in diaphragm locking device. Built-in colour conversion filter with automatic swing-out when inserting a daylight film; additional filter switch on the camera body.
 - Film drive by means of a sub-miniature motor. Transport mechanism speeds: 9 fps, 18 fps and single-frame feed. Sector aperture of the rotary disc shutter is 220°.
- Mechanical release. Power supply by two 1.5 V miniature batteries, which also serve for supplying the automatic exposure system and the focal-length motor.
- Compact body with fold-away handle and carrying strap, bat-

tery test button and $\frac{1}{4}$ " tripod bush. Forward counting unexposed film indicator with automatic reset during film insertion. Built-in automatic release; sets camera in motion after approx. 10 sec. of delayed action period for approx. 10 sec.

- Accessories: Rexine bag, cable release 30 cm or 50 cm, screw-on filter 43 mm dia., lens cap 45 mm dia., wide-angle attachment.

AV-Informator 2234

The new AV-Informator 2234 manufactured by -bke-Bildtechnik is compact, easy-to-use and inexpensive. The external dimensions of the basic unit are 27 mm high × 40 mm deep × 65 mm wide. The projected image in the DIN A 4 horizontal format is contrasty and brilliant even with powerful room lighting. The life of the special projection lamp with a power of 250 W is 2000 hours.

Mechanical reliability is catered for by a special projector particularly developed by -bke-Bildtechnik. It operates with a picture disc incorporating 24 miniature slides in the 24×36 mm horizontal format. The feared jamming of slides has been eliminated by the design. The picture cycle is only 0.5 sec.



AV-Informators 2234 may be set up on a floor tripod, a wall bracket or on a table. There is also the facility of a ceiling fixing with pendants.

The combination with a sound equipment in conjunction with built-in external loudspeaker or with hand receivers is provided for.

Fields of application for the AV-Informator 2234 are, among others, interior or shopwindow pictorial advertising on a continuous basis, information in savings banks or bank vestibules, aid in the introduction of new products in multiple stores and consumer markets or pictorial publicity at trade fairs and exhibitions.

Manufacturer: -bke-Bildtechnik, Postfach 1149, D-3412 Nörten-Hardenberg, West-Germany.

Miniature projectors with ultra-long lens focal lengths

In lecture theatres and large lecture or congress halls there is often the need for projecting over long distances. With distances of up to 60 meters between projector and screen, lenses with focal lengths of 400 and more millimeters are required. As a rule, however, only lenses with focal lengths up to a maximum of 250 mm are available as accessories for quantity-produced miniature projectors.

In order to fill a long-felt need and to cater for numerous cases of need, -bke-Bildtechnik is equipping standard projectors, especially, however, units with fast lenses of the modified Super-Lite series, with special lenses with a focal length of up to 650 mm. The condenser systems are adapted to these extreme focal values. The lens bodies attached far away from the projector housing are fixed to a guide linkage and can be focused manually or by means of a motor drive.

With focal lengths from 400 mm upwards, projector and lens body with guide linkage and tube are mounted on an additional special



tripod for counterbalancing purposes, the tripod being positioned below the load centre of gravity of the total installation.

Distributors: -bke-Bildtechnik, Burgstrasse 3, D-3412 Nörten-Hardenberg, West-Germany.

Central control system for multivision displays

The success of good multivision displays not only depends on the artistic design, but also a perfect technical execution. In this instance it is of importance to operate with exceptionally reliable, clearly arranged and simple to operate apparatus.

-bke-Bildtechnik now present a central control system for multivision installations which was developed by being based on their own wide experience in the practice of giving multivision shows.



The control system is built up on the building block principle of three main modules: punched tape control unit, an intermediate control unit for permitting manual intervention with all the functions and for correcting possible errors in the showing and an observation section with built-in TV monitor and monitor loudspeaker.

According to the demands made upon the setup and the size of the multivision installation, the individual unit modules may be varied. As punched tape readers there are versions available with 8, 22 or 40 channels. Wideband punched tapes are used which have the advantage in contrast to frequency-multiplex methods or similar fully electronic methods that the program sequence can also be read visually from the perforations and checked.

The intermediate control unit possesses a keyboard, with the aid of which each projector can be switched backwards and forward individually. In addition it comprises for all projectors the functions "Total transport FORWARD", "Total transport BACK" as well as "Light ON and OFF" for the whole of the installation. The intermediate control unit also contains the multiple contact connectors for the connection of control line distributors. In this manner the often dreaded "cable spaghetti" is very largely avoided. The observation section is placed above the intermediate control unit. The former is connected to a small video camera, with the aid of which the projection surface can be supervised from the viewer's side. The multivision grid as a rule is drawn on the monitor tube with a greasy pencil and the individual areas are numbered. In the case of a fault this allows the immediate recognition which projector group has to be tested or repaired. In addition to the picture information, the associated sound

information is transmitted via an external microphone.

With the new control system the operating technician has even large multivision installations continuously under his control from a comfortable armchair.

Manufacturer: -bke-Bildtechnik, Burgstrasse 3, D-3412 Nörten-Hardenberg, West-Germany.

New "Unisetete" from BASF

The cassette has very largely replaced the reel tape in the amateur field. In the professional field where highest demands are made on the electro-acoustic quality and reliability, the cassette technique could not establish itself to any large extent. The reason for this is in part that the cassettes known so far (compact cassette, cartridge) have not as yet been able to compete regarding these requirements with the reel tape.

The new cassette "Unisetete" was therefore specially designed for meeting the strict demands of professional audio technique. It combines both the advantages of the cassette and the reel technique:

- Magnetic tape 6.3 mm (1/4")
- Accurate tape guidance only influenced by the unit
- Uniform tape run, only influenced by the unit
- highest possible recording density
- absolute operational reliability
- high level of freedom in the design of apparatus.



The chief feature of the "Unisetete" is the type of tape guidance. The tape is only in contact with two accurately machined idlers as well as with two cores of take-up spools, in addition to which it has no contact with the body parts. Not only the guide rollers but also the cores of the take-up spools are automatically brought by the playback unit into their accurate position which is independent of the cassette housing. Azimuth errors due to the cassette and wow and flutter no longer occur.

As soon as the "Unisetete" is removed from the playback unit, both take-up spool cores are automatically blocked and the tape hubs protected by two plates with variable spacing. In this manner tape loops and loose tape are prevented.

Exceptionally large designed front apertures permit the apparatus manufacturer the use of three knobs. The tape/head contact can be made, as in the professional technique, by a head wrap without employing a pressure agent. A capstan with a diameter of up to 7 mm can be applied for the tape drive.

The dimensions of the Unisetete are: 94 mm high, 148 mm wide, 19.5 mm deep. It can be made up, in accordance with the respective requirements, with different types of tape. The maximum playing time in one direction of tape run at 9.5 cm/sec. is 15 min. for long-play tape (86 meters), for double-play tape 20 min. (114 meters) and for triple-play tape 30 min. (171 meters).

The "Unisetete" may be applied wherever the quality and reliability of professional technique is demanded, for example: broadcasting (studio and reporters apparatus), documentaries, language laboratories, the exacting amateur market (semi-professional).

Manufacturer: BASF Aktiengesellschaft, D-6700 Ludwigshafen, West-Germany.

Texture effects with portraits and publicity photographs

Texture effects are structural sheetings which you quite simply place on the paper during enlarging or which are inserted as texture effects mini together with the negative in the negative carrier. With the aid of these sheetings—applicable with black-and-white or colour—artistic effects are achieved in the style of the old masters or modern graphic art.

Most of the patterns compensate hardnesses in lighting and reduce spotting and retouching work. Very big enlargements are possible.

With the sheets for placing on paper, the use of only one sheet results in several possibilities for manipulating a photograph by overprinting, pre-exposing, shading, etc.

Altogether the following structures are available: etching effect, fresco, van Dyck, canvas, pastel, Old Master, fabric effect and Irish Linen.

New: Nizo macro cameras Distance setting from 0 cm

In practice the following is feasible: placing a slide on the lens of a film camera of the new Nizo macro-series, adjusting the macro equipment (subject distance 0 cm), running off the film.

This is equally possible with a petal or a grass panicle. In this manner an optical smash hit can be combined additionally: take away the leaf, during the shooting adjust the distance on to something interesting in the background (depth-of-focus pulling) and "running through" the focal length of 7 and 8 mm respectively during the shooting with the automatic system up to the tele final position. This scene turns into a real visual uproar on the projection screen.

Tele final positions with the Nizo 481 macro signify 48 mm with a variable focus range of 1:6; with the Nizo 561 macro 56 mm with a



variable focus range of 1:8 and with the Nizo 801 macro 80 mm with a variable focus range of 1:11.4. With the different tele focal lengths and variable focus ranges, the main differences between the three new Nizo cameras have also been enumerated. All film cameras offer seven automatic systems which assist in the first film being a success.

In order that the one-thousandth film too is still fun, the Nizo macro cameras possess variable rotary disc shutters, fading devices, single-frame automatic systems for timelapse shots up to 1000 times the original sequence, time exposures up to one minute, sound terminals with a built-in 1000-Hz oscillator, as well as the ease of operation taken for granted with a Nizo film camera.

Manufacturers: Braun Aktiengesellschaft, Russelsheimerstrasse, D-6000 Frankfurt (Main), West-Germany.

New from Hasselblad

It must not always be world-shaking new designs which help in

making photography more pleasant and more successful. Frequently it is the little things that are of importance.

- The former rigid *focusing hood* has been improved considerably; focusing ring for the eyepiece compensates faulty vision of ± 3 diopters; sharp focusing with a 2.5 times enlargement of the whole of the groundglass image; all metal parts are black enamelled.
- Extra wide adjustable *carrying strap* of black, non-slip nylon fabric with special clamps for the secure fastening onto all Hasselblad cameras.
- *Professional lens shade* with mount for a 75x75 mm gelatine filter—secured against dropping out—directly in front of the lens.
- Two new *carrying cases* with a modified layout of divisions are now also suitable for the 500 C/M with TTL exposure meter and the 500 EL/M.

Distributors: Nordic Im- und Export Handelsges. mbH, Hufnerstrasse 20, D-2000 Hamburg 76, West-Germany.

New product from Novoflex

In view of the fact that a few Japanese camera manufacturers also supply bellows attachments and these are frequently described as "automatic" bellows attachments, although the semi-automatic diaphragm has to be released with a double cable release, there is considerable confusion even in expert circles.

The patented Novoflex automatic bellows attachments, however, permit the use of the lenses in such a manner as if they were directly connected to the camera body, i. e.:

without a double cable release, the diaphragm jumps on to the preselected value and immediately opens, providing the attachment had been specially designed for the camera (which applies in each instance, with the exception of the attachments with an M 42 thread).

In addition only the Novoflex automatic bellows attachments have a diaphragm simulator for Canon, Contax RTS, Konica, Miotta, Miranda, Olympus OM1 and lately also for all Nikon models. This simulator has the effect that the time of exposure measured with an open aperture (bright groundglass

image) is correct automatically for each preselected smaller diaphragm and that with the Konica the EE automatic state is maintained.

Frequently it is also overlooked that Novoflex units simultaneously possess a focusing sliding carriage. The necessity for having this unit is quickly recognized if at times close-ups are taken with the tripod or the copying stand. If the advantages mentioned and the favourable dimensions of the Novoflex units are considered, then these units do not have to fear a price comparison, since it will, in each instance, prove in favour of the rugged, ingeniously designed Novoflex unit which is endowed with important advantages.

Too few purchasers also make use of the facilities which offer themselves due to the purchase of the 105 mm/1:4 Auto Bellows Novoflex lens head. While the standard lenses on the bellows attachment produce focusing ranges of approx. full-size up to 3 times, the 105-mm lens head permits extending the focusing range continuously up to infinity. This means in practice that this lens head can be equally well applied for the copying of postage stamps and pictures of any size, for the photography of live butterflies, for portraits and high-speed snapshots.

In view of the fact that almost all powerful camera lenses do not provide the maximum of sharpness in the macro range, Novoflex supply the 60 mm/1:4 Auto-Bellows-Novoflexar. In order to achieve optimum sharpness with conventional



lens designs, the lens is employed with the aid of a reversing ring (which is not available for many makes) in such a manner that the back lenses point in the direction of the subject, stopping down being effected manually. The 60-mm

Auto-Bellows-Macro-Novoflexar is the only macro lens with which the semi-automatic diaphragm is maintained and which supplies a greater sharpness without reversal and brilliance than even the most expensive conventional lenses in the reversed position.

Manufacturer: Novoflex Foto-geratebau, D-8940 Memmingen, West-Germany.

hähnel-Titraflex

With the Titraflex titling unit a system was expanded which reaches an optimum in versatility. Just as with professional filming, practically all titling ideas can be realized:

Panned titles, horizontal and vertical, wipe titles, rising titles, sliding titles, running titles and title fade-ins into running films (background projection).

The titling unit Titraflex is exceptionally suitable for cameras with a reflex finder. Special importance is due to the zoom lens, since with its use medium long-shots or sections of titles can be filmed.

Collectors ahoy! Prontor jubilee

The electronic era in the design of shutters for large-format cameras was ushered in with the Prontor Press Electronic in 1965. The timing of the shutter speeds—from $1/125$ sec. to 32 sec.—takes place fully electronically via 22 transistors, resistances and capacitors. The electronic circuitry of the shutter also allows the exposure time to be controlled externally by means of a CdS cell or a remote control panel. On the occasion of the 10th anniversary of the introduction of this, first self-cocking electronic shutter in the world, which was entirely developed by Prontor, the Calmbach manufacturer has decided to produce a special series. The shutters in this limited "Jubilee Series" are numbered from 1 to 1000.

Orders for one of the shutters will be treated on a "first-come-first-served basis", the date of arrival at the Prontor-Werk, D-7547 Wildbad-Calmbach, being decisive.

These shutters are mounted on a Plexiglass plate and have a transparent housing, so that elements and their function can be observed.

Super 8 film, referred to derogatively as "bootlace film" not so very long ago, has now reached a standard of quality which few people could have imagined possible at its innovation. It is above all due to considerable advances in the field of electronics that technicians have been able to design apparatus which is child's play to operate and costs little to run. For example, super 8 film with magnetic striping, even at 18 fps, possesses a tonal quality today which is even superior to the optical sound tracks on 35 mm film copies used in our cinemas! Anyone who has followed the progress of development in this field will share the conviction that super 8 film will find increasingly wide application in future. This applies not only to the amateur cinematography but also in the fields of industry, science and education. The technical progress that has been made so far is best illustrated by taking a good example, the Bolex sound camera.

The picture thrown on to the screen is, apart from the personal skill of its maker, the final product of a long chain of technical processes for which a succession of highly varied apparatuses must be used. Yet, in the last analysis, the sole deciding factor is the quality of the image perceived and the sound heard by the audience. Seen from this aspect, one realizes just how important the efficiency of each individual link in the chain is. In turn, each of these units must be mutually compatible if the best possible results are to be achieved. This was only too apparent to the manufacturer Bolex, and is the reason why the name "Bolex Sound" refers to a complete, self-contained super 8 system. In this way Bolex were certain of guaranteeing the customer maximum image and sound quality. The "Bolex Sound" system includes the following equipment:

1. the new live sound cameras BOLEX 580 Sound and BOLEX 550 Sound. These are backed up by three microphones with different characteristics and the Sennheiser headphones HD 414.
2. BOLEX SM 80 "electronic" projector with dual track technology and automatic start at preselected frame.
3. Hi-Fi Loudspeaker "SK 45" (serves as transport case) 45 watt maximum rating, 25 watt sine continuous signal.
4. Viewer/editor "V 180 Duo" with magnetic sound monitor.

Has Super 8 technology now achieved perfection?

by Hans Bluth

Bolex 580 Sound

The top-flight model in the Bolex range of sound film cameras with 8x zoom and sophisticated features for the serious movie-maker.

Technical data:

- for sound and silent film cartridges
- 6—60 mm f 1.7.8x zoom BOLEX Varig, either manual or motor drive
- TTL metering system for film speeds from 24 to 160 ASA, also aperture override
- large reflex-type finder with microprism range-finder; visible in the finder are the following: aperture scale with indication of over and underexposure, signals for film transport, end of film, respectively last meter of film, a green signal for monitoring the sound recording

- electronic fade-in/fade-out
- film counter in meter and feet with automatic zeroing
- Bolex "action light" which indicates to the actors when the camera is running
- chargeable NC accumulators incorporated in the camera
- socket for a timer to take individual shots at intervals ranging between 0.5 and 60 sec.
- automatic regulation of the sound level in two sensitivity stages; L = low: low sensitivity to avoid noises in the background during interviews etc.; H = high: high sensitivity
- double sound recording check via LEDs visible in view-finder and connected earphone
- camera remote release via microphone button, e. g. for reporting, self-portraits, etc.



5. BOLEX cement-type splicer (bevelled edge) and as a supplement: the new dual striping machine "2 S", as well as the well-known THORENS record player which is most suitable for sound editing of a high quality.

Live sound recording

The wish to be able to add original sound to 8 mm cine film is almost as old as narrow-gauge movie-making itself, and there have been plenty of attempts in the past to try and realize this dream. It has been a long and thorny way and, on look-

ing back today, one can say that it was necessary, since only now do we have a reliable system which might be regarded as final as far as the principle is concerned. It is, in actual fact, quite simple!

The sound recording takes place in the camera itself on the new Kodak sound films (Kodachrome 40 and Ektachrome 160) which have been coated by the manufacturer with a 0.8 mm broad magnetic sound stripe as well as a 0.3 mm broad balance stripe. The processing solutions have absolutely no effect on these sound tracks during development. The film cartridge resembles very closely the customary super 8 silent cassette and is just as easy to handle. (Super 8 silent cartridges may, of course, be used in sound cameras should one wish to forego a live sound recording.) The balance stripe located outside the perforation on the film fulfills several purposes:

1. It compensates for the extra thickness of the first magnetic stripe and thus ensures that the film lies flat in the camera plane of focus, respectively, the projector.
2. It ensures that the film does not become lop-sided when spooling greater lengths of film and helps to reduce mechanical wear and tear on the film, since the image-bearing part of the film is raised up on the two magnetic tracks at the edges.
3. Last but not least, the balance stripe serves as a secondary sound track for subsequent recording in conjunction with the "SM 80 electronic" projector. In this instance the sound quality is almost as good as track No. 1. Only the volume is less on account of the narrowness of the track; this can be compensated for by turning up the recording level a certain amount.

The complete camera weighs only slightly more than 70 oz. and is thus not much heavier or larger than a conventional silent camera. Hence the first and most important prerequisite for a handy, uncomplicated and reasonably priced camera has been fulfilled.

At the first glance the BOLEX 580 and 550 would seem identical, but in practice one might say that they complement one another, since the BOLEX 550 is a so-called XL camera. It features an even faster lens (f. 1.2), a rotary disk shutter with a 220° open sector and an external exposure meter. 550 is therefore suitable for shooting

under extremely poor lighting conditions. In conjunction with high-speed film one obtains an increase in usable light of about 20x in comparison to the BOLEX 580.

A number of special features incorporated in the sound cameras have proved most valuable in practice:

1. The so-called "action light", a red light which shows up beside the lens when the camera is running and thus warns the "actors" that they are being taken.
2. Chargeable NC accumulators which have double the capacity of conventional dry batteries and maintain constant voltage down to -10°C . They may be loaded up a thousand times or more from the mains network or from a car battery.
3. A timer which releases individual exposures at intervals from 0.5 to 60 sec. automatically.
4. Changing cartridges of different film speed rating is facilitated by a so-called "memory" counter with sliding scales.

The practical aspects of sound recording

Anyone tackling this field for the first time will have to observe one or two points:

First of all there is the fact that the length of each "take" will now be determined by the sound component. This usually means that the length of each scene is greater in the case of silent film. Monotony can be avoided by zooming in or out at an appropriate moment. One should avoid, if possible, breaks within a scene, since after the camera has been started, the amplifier requires a second to fully fade in the sound. There is, of course, always the possibility to use the second magnetic stripe for a later superimposition of sound.

The most favourable position for the microphone can be found with the aid of the headphones. When, for example, a conference group is being recorded, the mike should be placed in the centre of the group so that the sound level of each voice does not vary too sharply. During the recording the mike and cable should be held as steadily as possible, since otherwise the result later will be a horrible gurgling noise in the loudspeaker. Further, one should observe that, although a distant object may be brought nearer by means of zooming, the mike does not alter its position. This



Below: Modern design and functionally arranged controls are characteristic of the new "Bolex SM 80 Electronic" projector.

must be taken into account beforehand when locating the mike. There is the possibility, during the zoom to switch over to a higher sensitivity. Through boosting the sound level one obtains the impression that noises in the distance are more clearly audible. At any rate, a uni-directional microphone, with its lobe characteristic, is of great advantage here.

As already mentioned, the amplifier brings in the sound gradually as the camera motor starts. Even if one intends cutting a film later, it will be necessary to start the camera running one second early and leave it on one second after the "sound event" has finished.

This type of recording via the mike is not intended solely for speech or location noises. It is just as feasible to play a tape or cassette recorder directly at the camera. We thus have, in principle, the possibility to also work with a playback system.

Film editing

The serious amateur will, of course, also wish to cut and cement his films. This is also feasible in the case of live sound movies, although the picture and the sound are spaced, according to standard specifications, 18 frames apart. That is to say, a portion of sound track will be found 18 frames before its relevant picture. This is unavoidable in the case of Commag sound,

since the film is transported through the gate in jerks, whereas the sound head requires an absolutely even film transport. Only 7.6 cm (18 frames) are sufficient to bring about a uniformly smooth passage of the film over the sound head.

At the first glance, the cutting of the Commag film would appear to be complicated theoretically, perhaps even impossible in practice. In reality, however, there are practically no difficulties if one remembers the following tip when taking: one second before the commencement of an actual sound scene start the camera motor running; keep it running at least one second after completion of the scene. It is then possible to cut the film as desired without any loss of sound. We are assuming here that the sound determines the essential beginning and end of a particular scene. If we have started the camera one second earlier, we can simply cut the film where the "sound event" starts, since at this point the picture "fits" the scene anyhow. Contrary to this, we must cut the film 18 frames after conclusion of the sound event, so that as the sound is heard there will still be an appropriate picture on the screen. Normally, of course, we would find at this point the sound for the following scene. Since we remembered to run on the camera at the end for a second or two, we may cut the film at this point without any loss. To sum up, a cut is

made before the frame where the "sound event" begins; the final cut is made 18 frames beyond the end of the "sound event".

But how can one find the point at which a passage of sound begins or ends? Bolex also thought of a solution to this problem: With the aid of the "V 180 Duo Editor" and the accompanying earphones one can find and accurately mark the point at which the film should be cut.

The BOLEX SM 80 electronic

The new projector SM 80 was created, in actual fact, for the live sound system, since it offers the possibility, as already mentioned, to record additional sound on the balance stripe. This has, in the first place, the advantage, that the additional sound is recorded exclusively on this second track thus leaving the original sound on the first or main stripe intact. If desired, it can be partially or entirely erased at a later date. This mode of sound recording ensures, above all, that the original sound is not impaired in any way through an operational error.

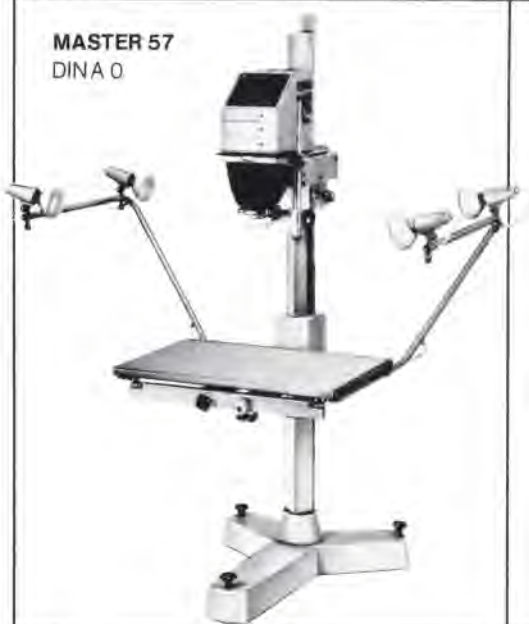
The dual track system also has advantages in the case of a subsequent addition of sound, since any mistakes the speaker may make can be corrected without influencing the other stripe. The recording of music is best made on the main stripe and speech on the secondary stripe. A gradual fade-over can be effected by alternatively recording on stripes 1 and 2. An interesting echo effect can be obtained through recording the music on both stripes, but displacing the two recordings by a space of about one frame.

Further, the dual track technique can also be employed in order to record different languages on the same film, e.g. German and English. This is a most interesting proposition for those firms which send advertising films to their foreign representatives.

An absolute novelty is to be seen in the injection of music or speech with the exactitude of one frame, a task which formerly presented insurmountable problems.

After decades of untiring research in the fields of photochemistry, optics, precision engineering and electronics, the Super 8 film is now not only a highly economical proposition but has reached a standard of perfection which makes it eminently suitable for an even wider field of application.

MASTER 57
DINA 0



COLOR 45



KOMPAKT 9x12



DINA 0



REGISTER 9x12



COLOR 57



Linhof, the prestige enlarger

Top-flight enlargers with micro-pin register system which can do more than merely enlarge. With surface finish resistant to lab chemicals, of rigid construction and practical design, they guarantee simple operation. A perfected system of accessories permits one to tackle even out-of-the-way jobs in the fields of printing, photographic, copying and screening. Negatives – color as well as b/w – and transparencies in all sizes from 35 mm to 5x7 inch may be enlarged up to 20x24 inch, 24x36 inch, or even as large as DIN A 0 (33.4x47.2 inch) using the motor-driven model. According to the purpose, one may have condenser systems with opal bulb, point-source lamps (e.g. for microfilm retrieval) or diffuse, cosine-corrected halogen illumination system which cuts down on retouching. Color heads with dichroic filters and built-in blower with service life of 20,000 hours may be quickly exchanged for condenser/lamp housing. The new COLOR 45 incorporates a transfocal condenser system and – thanks to the fact that one can override the spindle drive – one can carry out large adjustments for head height quickly and from a comfortable sitting position. Just tell us your problem – we'll find the answer. Send now for an illustrated prospectus.

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16 mm CAMERAS

Gerhard Fromm

The following review is intended to give an up-to-date, general impression of the 16-mm cameras at present on the international market. It is not an easy matter to select a camera which exactly covers one's own particular field of operations. One must consider what kind of assignment the camera is intended for at present and what sort of special work may have to be coped with in the near future. There are features such as high-speed shutters, micro/macro setting and trick facilities which are better on some cameras than on others. Sometimes the appearance of a camera plays a major role in the decision. Then there are some of which the designers are especially proud and, in their advertisements, point out how light a particular model is or how much technology they have managed to pack into a tiny space. On the other hand, we have all seen some monster machines bristling with knobs and buttons but which prove extremely clumsy in operation. Others give the impression that they are destined for the unskilled hands of the beginner but, in the field, turn out to be good performers on which only non-essentials have been renounced.

All this goes to say is that one should not judge a camera by its mere appearance. It is a very good idea to try and hire a partic-

ular apparatus and shoot several scenes with it before finally deciding to buy it. Such direct experience soon shows whether a camera is to one's liking or not. Since prices range from £ 300 to £ 3000 the wrong acquisition could prove a disaster!

The job of a cine camera is, of course, to progressively expose the film and produce sharp images. Apart from this basic requirement, the features to be found on a random selection of cameras are highly varied. A built-in exposure meter is certainly important for reportage, a good focus puller should be available for studio work and the mountaineer will obviously be interested in the weight of a camera. With respect to the technical specification, one might mention that, as far as exposure measuring systems are concerned preference is currently given to through-the-lens (TTL) metering. Indicators to show the state of battery charge, footage of film left, disturbances in the synchronous operation of the motor—should all be visible in the view-finder in the form of LEDs. Quartz regulation of the smoothness and uniformity of film advance is likewise another possibility open to the designer of modern movie cameras.

In the following market survey we have listed the most important

features of cameras on which we were able to obtain information. Of course, it is not possible to give a detailed account of all the pros and cons. The survey will have served its purpose when it helps the reader to select those manufacturers/importers from whom he would like more detailed information.

One or two remarks are called for about the abbreviations used in the survey: the expression "with light period corresponding to 180°" refers to the kind of shutter now used by most manufacturers which consists of a double-wing, rotary disc shutter. Since it runs at a 1:2 reduction in relation to the claw feed system, the "open period" has an angle of only 90°.

The filter gel holders mentioned are important if daylight film has to be exposed by artificial light. The appropriate Wratten 85 filter can, of course, also be obtained as a mounted glass filter, but if the available lens diameters vary widely and such temperature conversions are not frequent, the cheaper solution by far is to use gelatine filter foils. A few of the cameras described can also be used for the super 16-mm format. This gauge is only of significance to the motion picture industry, since it is intended for enlarging onto the customary 35-mm panoramic screen.



Arriflex 16 St.

Manufacturer: Arnold & Richter KG., 8000 München 40

Distributor: (UK) Rank Audio Visual Ltd., PO Box 70, Brendtford TW 8 9 HR

Compact motion picture camera for the newsreel and television reporter and general documentation. "St" = "Standard". Accepts in housing 50-ft or 100-ft daylight-loading spools. Extra magazines for up to 400 feet of film may be attached. 180°-rotary mirror shutter, not variable. Interchangeable focusing screens with 10× magnifier and device for excluding light from the rear. Periscope finder attachment available.

Choice of motors: hand-adjustable motor for 4 to 48 fps, may be switched to "forward" or "reverse". Synchronous motor for 24 or 25 fps, also crystal-controlled motor. Diverging lens turret with provision for three lenses, one with bayonet mount. Latest model incorporates semi-automatic TTL exposure metering.

The extremely robust design and reliability of this camera have made it very popular amongst 16 mm cinematographers all over the world.

Weight of the camera ready for operation: 4.5 kilo/9.9 lb.



Arriflex 16 M

Manufacturer: Arnold & Richter KG., 8000 München 40

Distributor: (UK) Rank Audio Visual Ltd., PO Box 70, Brendtford TW 8 9 HR

Compact motion picture camera accepting 200 and 400-ft magazines. "M" stands for Magazine. Mirror reflex rotary shutter with 180° open sector. Interchangeable focusing screens, 10× magnifier, eyepiece either with or without automatic closure device, periscope finder attachment. Single compartment magazines driven mechanically by the camera. Diverging lens turret with provision for three lenses, one with bayonet mount. Interchangeable motors as for Arriflex St. May be regulated from 4 to 48 fps, synchronous motors and crystal-controlled motor also available. Built-in Pilotone signal generator and start mark facilities. *Weight of camera ready for operation:* 6 kilo/13.2 lb.



Arriflex 16 BL

Manufacturer: Arnold & Richter KG., 8000 München 40

Distributor: (UK) Rank Audio Visual Ltd., PO Box 70, Brendtford TW 8 9 HR

Self-blimped camera designed for studio or news reporting using interchangeable magazines. "BL" stands for "Blimp". Film capacity up to 120 m/400 ft wound on darkroom cores or 200 ft on daylight spools. 180°-rotary mirror shutter. An electronic device in the latest "EQ" version leaves the shutter open for viewing when the camera is switched off. Arri bayonet lens mount for zoom lenses with blimp and fixed-focal-length lenses in universal blimp. TTL exposure measuring system with follow-up pointer visible in view-finder. Variety of motors available: 12 V DC universal motor, synchronous motors, quartz crystal control. May be set for either 24 or 25 fps, and external variable speed control unit can regulate speed between 10 and 40 fps. Although originally intended for tripod operation, an offset view-finder enables one to shoot from the shoulder with the camera. Through incorporation of a magnetic sound module, the camera can be adapted for single-system sound. It is then possible to record synchronous sound on single-system 16 mm film.

Noise level: approx. 28 dB (A)

Weight: 8 kilo/17.6 lb.



Arriflex 16 SR

Manufacturer: Arnold & Richter KG., D-8000 München 40

Distributor: (UK) Rank Audio Visual Ltd., PO Box 70, Brendtford TW 8 9 HR

Self-blimped camera designed for off-the-shoulder operation with rapid-change magazines. "SR" stands for Silent Reflex. Takes up to 400 feet of 16 mm film. Mirror rotary shutter with 180° open sector, special, interchangeable focusing screen of fibre glass, 12× magnifier, slot for filter gels. Co-axial rapid-change magazines for 100-ft daylight spools or up to 400 feet of film on core-wound rolls. Arri bayonet lens mount with automatic diaphragm system. TTL CdS exposure meter with follow-up pointer visible in view-finder. Motor electronically controlled for taking 24 or 25 fps. May be regulated from 24 to 50 fps. Integrated, plug-in 12 V NC battery. *Special feature:* the rapid-change magazines have central film guides by means of which it is always possible to check the correct path of the feed and take-up loops. After mounting the magazine, a spacer channel is formed through which the film runs freely. In the area of the film gate, the film is held absolutely flat in the focal plane by a springloaded plate.

Noise level: about 31 dB (weighted A)

Weight of the camera ready for operation: 5 kilo/11 lb.



Aäton 7

Manufacturer: Aäton SA J-P
Beauviala, 38001 Grenoble, France

Distributor: Aäton SA J-P
Beauviala, 38001 Grenoble, France
Camera designed for off-the-shoulder operation in the fields of news reporting and documentation. Film capacity of up to 400 ft in co-axial, rapid-change magazines. Mirror reflex viewfinder with 185° rotary shutter, remains automatically open for viewing when motor is stopped. Special type of bayonet lens mount, adapters for "C" and "Arri" lenses available. Quartz-controlled motor (non-interchangeable) for 24, resp., 25 fps., adjustable from 5 to 36 fps. Warning indicator in finder for non-synchronous operation, battery check. Built-in Pilotone signal generator and start mark facilities. Adjustable hand-grip with "On/Off" switch.

Special feature: the camera incorporates a "beam-splitter" by means of which it is possible to employ, without any adaptations, a miniature TV camera to monitor the picture or for image-recording purposes.

Noise level according to DIN: 30 dB (A)

Weight of camera ready for operation: 8.2 kilo/18 lb.



Beaulieu R 16 Electronic

Manufacturer: Beaulieu, Paris

Distributor: Hervic Corp., 14225
Ventura Blvd., Sherman Oaks, Ca.
91403, USA

Hand camera of compact construction due to integration of battery in hand-grip. Accepts up to 100 feet of film in housing or 200 feet by means of attaching extra magazine. Reflex viewfinder with oscillating mirror (exposure period corresponds to 150°-sector of a rotary shutter). Exposure at 25 fps = $1/60$ sec. Finder automatically remains open. Lens turret with triple "C"-type lens mounts permits use of lenses in variety of mounts. Built-in Gossen TTL exposure meter. The R 16 A version features fully automatic diaphragm operation in conjunction with certain zoom lenses. In the case of the latter lenses, power zoom is also possible.

Pilotone generator may be inserted for synchronous sound recording.

Weight of camera ready for operation: approx. 4.5 kilo/14.7 lb.



Beaulieu 16 "News"

Manufacturer: Beaulieu, Paris

Distributor: Hervic Corp., 14225
Ventura Blvd., Sherman Oaks,
Ca. 91403, USA

Compact Camera for off-the-shoulder operation using 200-ft daylight magazines. Viewfinder system incorporates oscillating mirror (guillotine type), swivelling but non-interchangeable magnifier. Adapter for using left eye.

Compact construction on account of the co-axial film reels, automatic film take-up, finder remains open. "C"-type lens mount permits, via adapters, use of other makes of lens. Zoom lenses supplied at present by Beaulieu feature fully automatic diaphragm and power zoom. The necessary control unit on the right-hand side does, however, restrict the use of ultra-wide angle lenses.

Interchangeable motors, two different models controlled by quartz crystal, provision for single system and Pilotone via easily-insertable modules. Motor may be regulated between 12 and 40 fps. Integrated 9.6 V battery can transport 10 reels of 200 ft. each on one charge.

Weight of camera ready to operate: approx. 8 kilo/13.2 lb.



Bolex H 16 SBM

Manufacturer: Bolex International
SA., Switzerland

Distributor (US): Paillard Inc.,
1900 Lower Road, Linden, N. J.
07036

Hand camera, universal application due to wide range of accessories. "SBM" stands for Spring, Bayonet and Magazine. Accepts up to 100 feet of film (daylight loading) in the camera or up to 400 feet in additional magazine.

Mirror reflex finder system with beam-splitting prism, thus avoids flickering when motor is running. Rotary shutter has variable open sector—from 0 to 135°—even when shooting. Exposure time at 25 fps corresponds to $1/60$ sec., taking into account the light lost through the prism. Individual frame exposure of $1/40$ sec. or Time, also variable from 12 to 64 fps. Special bayonet for mounting lenses incorporates retaining ring, enabling one to attach heavy zoom lenses without supporting cradle.

Slot for gelatine filter holder with intermediate "ready" position. The single compartment external magazine can only be used in conjunction with one of the two electric motors available. The "ESM" motor may be stabilized by means of an auxiliary crystal control unit, thus permitting one to record synchronous sound via the double-headed system.

Weight of the camera ready for operation: approx. 5 kilo/11 lb.



Bolex H 16 EBM EL

Manufacturer: Bolex International SA., Switzerland

Distributor (US): Paillard Inc., 1900 Lower Road, Linden, N. J. 07036

Hand camera with electric drive. "EBM" stands for *Electric motor, Bayonet and Magazine*. Accepts up to 100 feet of film in the camera housing or 400 feet in additional magazine. Reflex viewfinder with beam-splitting prism, hence avoids flicker when motor is running. Rotary shutter with 170° open sector. Speed of 25 fps corresponds to $\frac{1}{60}$ sec. (taking into account loss of light through beam-splitter). Picture frequency may be varied from 10 to 50 fps, electronically stabilized.

A hand-grip with integrated battery can be attached beneath the camera and the latter connected up by means of a short cable. Slot for gelatine filter holder with intermediate "ready" position. Adaptable for Pilotone and start marks.

Weight of camera ready for operation: approx. 5 kilo/11 lb.



Bolex H 16 EL

Manufacturer: Bolex International SA., Switzerland

Distributor (US): Paillard Inc., 1900 Lower Road, Linden, N. J. 07036

Compact hand camera with electric motor drive. "EL" stands for *Electric motor and Light measurement*. Accepts up to 100 feet of daylight-loading film in the housing itself or up to 400 feet through attaching an extra magazine. Reflex finder system incorporating beam-splitting prism, which implies flicker-free viewing even when motor is running. Rotary shutter with 170°-open sector. Exposure at 25 fps corresponds to $\frac{1}{60}$ sec. Picture frequency may be adjusted between 10 and 50 fps. (Electronically stabilized). Also, single frame exposure, reverse and remote control are possible.

Special coupling ring for lens bayonet mounts. Slot for filter gels. Semi-automatic TTL exposure measuring system. A small 0.45 ah accumulator may be attached to the camera door. When using an external magazine, it is advised to fit the 1.2 ah battery which can transport up to 5 films of 400 ft each on one charge.

Pilotone generator and start mark facilities are integrated. It is possible to connect up an external quartz control unit.

Weight of camera ready for operation: approx. 5 kilo/11 lb.



Canon Scoopic 16 M

Manufacturer: Canon, Japan

Distributor (US): Canon USA Inc., 10 Nevada Drive, Lake Success, N. Y. 11040

Extremely compact hand camera. Accepts up to 100 feet of film in the camera housing, automatic threading.

Reflex finder with beam-splitting prism, rotary shutter with 170° open sector. Exposure time at 25 fps corresponds to $\frac{1}{60}$ sec. Non-interchangeable, fully integrated 12.5 to 75 mm f 2.5 Canon macro zoom lens. Astonishing optical effects can be obtained when using the macro setting. Non-interchangeable, electronically-controlled motor, adjustable speeds from 16 to 64 fps.

Battery is inserted into the camera housing and can transport up to 16 reels of 100-ft. film.

Exposure meter does not measure through the lens, so comparative readings are recommended when shooting close up or using long focal lengths.

Weight of the camera ready for operation: 3.3 kilo/7.2 lb.



Cinema Products CP 16 R

Manufacturer: Cinema Products, Los Angeles, USA

A self-blipped camera for off-the-shoulder operation in the studio or on location.

Accepts up to 400 feet of daylight-loading film or bobbin. 180°-sector rotary mirror shutter. Interchangeable fibre glass focusing screen. Standard magnifier or two-way magnifying glass (image always remains upright and right-way-round). Finder remains automatically open when motor stops. Slot for filter gels in front of the aperture and "reservoir" for two filters in the camera.

Non-interchangeable motor is crystal-controlled, 24, resp., 25 fps, speed may be regulated from 12 to 36 fps. The 20 V battery pack is inserted in the camera and transports up to 2600 feet of film on one charge.

Special bayonet lens mount; by means of adapter ring "Arritype" lenses may be used as well. As desired, exposure metering system is either semi-automatic or fully automatic.

Through inserting a magnetic sound module in the camera and employing an auxiliary amplifying unit on the side of the camera, it is possible to record synchronous sound according to the single system. Miniature TV camera may be attached.

Noise level according to DIN: approx. 29 dB (A)

Weight of the camera ready for operation: 6.5 kilo/14.3 lb.



Eclair 16 NPR

Manufacturer: Eclair International, Paris, France

Distributor: Eclair International, Paris, France

Camera designed for off-the-shoulder operation using rapid-change magazines. "NPR" stands for Noiseless, Portable Reflex.

Accepts up to 400 feet of film in co-axial magazines which incorporate the entire film transport mechanism and the film pressure plate. This means that the magazines can be changed extremely quickly. 180°-rotary mirror shutter, angle of opening variable from 5 to 180° with motor switched off. Lens turret with provision for mounting two lenses, either with 2 "C" mounts or one "C" and one "CA" mount.

Interchangeable motors, available from Perfectone, Beala or Aäton. The user has an option on features such as crystal control unit, automatically opening finder, built-in Pilotone generator, etc.

Extras: special magazines can be supplied which have integrated facilities for single-system sound. For special assignments it is possible to mount a magazine for 300 m/980 ft. of film.

Noise level according to DIN: 30 dB (A)

Weight of the camera ready for operation approx.: 4 kilo/8.8 lb.



Eclair 16 ACL

Manufacturer: Eclair International, Paris, France.

A universal but compact camera for operation off the shoulder. "ACL" stands for Autosilencieuse, Camera, Légère.

Accepts up to 200 feet or, with rapid-change magazine, 400 feet of film.

Reflex viewfinder system with extremely light oscillating mirror, rotary shutter with 175°-sector, non-adjustable. Slot for filter gels. Universal lens mount for "C"-type, Arri or Nikon-mount lenses. Motor is crystal controlled, 24 or 25 fps. Recently a "multi-programme" motor has become available which may be adjusted from 8 to 75 fps.

Exposure meter of match-needle type incorporating 7 LEDs in the finder. An unusual comparison measurement system has been developed. There are no conventional settings for film speed rating and picture frequency; instead, a comparative measurement is first of all made, the aperture set and then the built-in exposure meter has to be calibrated to these values. The rapid-change magazines incorporate the entire mechanism for film transport and the pressure plate so that changing is very fast.

Noise level according to DIN: 32 dB (A)

Weight of the camera ready for operation: 7.5 kilo/16.5 lb.



Frezzolini FR 16

Manufacturer: Frezzolini Electronics Inc., Hawthorne, USA

Self-blipped camera for off-the-shoulder operation. "FR" stands for Frezzolini Reflex.

Accepts up to 400 feet (or 1200 ft.) of film in double-compartment magazines of the Mitchell type. Rotary mirror shutter with 172°-sector, finder automatically remains open when motor stops. Out-of-sync operation is indicated in the finder by means of warning lamp.

Special bayonet lens mount, adapters for other makes of lens are available. Slot to accommodate gelatine filter holder. Motor is crystal controlled, variable for 12, 24, 36, and 44 fps.

Push-in 12 V battery unit, single charge can transport approx. 2600 feet of film. Adjustable hand-grip with "On/Off" switch.

Special service: Frezzolini can convert customer's own Auricon "Cine Voice" cameras into this reflex version.

Noise level according to DIN: approx. 30 dB (A)

Weight of camera ready for operation: 8 kilo/17.6 lb.



General Camera TGX 16

Manufacturer: General Camera Corp., New York, USA

Self-blipped camera for off-the-shoulder operation in the studio or on location. "TGX" stands for Texas (site of the factory), General (camera), Experimental (one kept the name of the prototype).

Accepts up to 400 feet of film in co-axial magazines inserted in the camera or up to 1180 feet of film in an extra magazine mounted on top the camera.

180°-rotary mirror shutter. Glass fibre focusing screen. Out-of-sync operation is indicated in the finder. Indicators also for film footage, state of battery charge and, if appropriate, sound modulation. Finder automatically remains open when motor stops. Accommodation for gelatine filter holder. Motor is crystal controlled, non-interchangeable, for 24 or 25 fps. May be regulated from 18 to 48 fps.

Push-in battery unit can transport up to 3280 feet of film on one charge. Special lens bayonet mount permits the use of lenses on a variety of mount types. Through the insertion of a magnetic sound module and connection to an external amplifier it is possible to record synchronous sound according to the single-system method. With the aid of focus-pulling device and an extension to the magnifier, this camera may be made suitable for studio work.

Noise level according to DIN: approx. 30 dB (A)

Weight of the camera ready for operation: 8 kilo/17.6 lb.



Mitchell-Wilcam W 2+4

Manufacturer: Mitchell Camera Corp., Glendale, USA

A compact camera for off-the-shoulder operation. Accepts up to 400 feet of film (or 1200 feet using special Mitchell magazine).

Reflex finder system incorporating 180°-mirror rotary shutter. Finder remains open automatically when motor stops. Built-in filter turret, operated from outside, for four gelatine filters. Type of filter in use is shown in finder; also film footage and aperture setting (if appropriate, sound modulation as well).

Special bayonet-type mount; Arri lenses may also be used via adapter. TTL exposure meter of match-needle type visible in finder. Electronically controlled motor, crystal unit for speeds of 24 or 25 fps, variable from 12 to 36 fps. 12 V NC battery integrated in hand-grip.

May be converted for single-system sound by inserting a magnetic sound module and attachment of an automatic amplifier. Pilotone generator and facilities for start marks.

Weight of the camera ready for operation: approx. 8 kilo/17.6 lb.



Pathé Webó 16 BTL

Manufacturer: Pathé SA., Paris, France

Distributor: Karl Heitz Inc., 979 Third Ave., New York, N. Y. 10022 Hand camera, may be supplemented through additional 200-ft. or 400-ft. magazines. "BTL" stands for *Behind the Lens*, drawing attention to the type of metering system.

Accepts up to 100 feet of film on daylight spools in the camera or 200, resp., 400 feet in one of the extra magazines. Reflex finder system with partially-transparent mirror, thus avoiding flickering of the picture even when the camera is running. Rotary shutter may be varied from 0 to 180°. Triple-mount lens turret employing "C-type" thread mounts.

Interchangeable rod-type motors with speeds of 8 to 25 fps or electric motor of 8 to 80 fps. Otherwise, clockwork motor which can transport 22 feet of film. Exposure meter measures the light reflected from the surface of the film emulsion. In the "BTL III" version the diaphragm setting may be verified by means of two LEDs visible in the finder (Duomatic). Several motorized zoom lenses available incorporating fully automatic operation of the aperture. May be converted for Pilotone recording.

Weight of the camera ready for operation: 4.5 kilo/9.9 lb.



Pathé 16 Reflex Electronic

Manufacturer: Pathé SA., Paris, France

Distributor: Karl Heitz Inc., 979 Third Ave., New York, N. Y. 10022 Compact hand camera, but has maximum capacity through extra, 400-foot magazine. Otherwise, accepts 100 feet of film on daylight spools in the camera.

Reflex finder system with partially-transparent mirror, thus avoiding flickering even when camera is running. Rotary shutter is adjustable from 0 to 180°, also when shooting. Lens turret features three "C-type" thread mounts. Motor is electronically controlled, variable speeds from 8 to 80 fps. The NC battery integrated in the hand grip can transport up to 2000 feet of film. Additional accumulators may be connected up by means of cable.

TTL exposure meter of the follow-up type, reading indicated in finder via LEDs. With appropriate motorized zoom lenses, fully automatic diaphragm operation is possible. Pilotone signal generator and start marker are built in for synchronous sound recording.

Special feature: this camera is also available in the same housing and with the same facilities for taking motion pictures on super 8 film.

Weight of the camera ready for operation: 4.2 kilo/9.2 lb.



Photo-Sonics Actionsmaster 500

Manufacturer: Photo-Sonics Inc., Burbank, USA

A compact camera for off-the-shoulder operation, especially for sports cinematography. Accepts up to 200 feet (resp., 400 or 1200 feet) of double-perforated film on daylight spools in rapid-change magazines. (It is also possible to use film stock wound on bobbins). Reflex finder system incorporating beam-splitting prism, interchangeable ground glass, magnifier likewise interchangeable. Slot for gelatine filter holder. Rotary shutter with 160° sector (optional variable sector from 8 to 160°). Lens mount compatible with Arri bayonet. The 28 V motor is electronically governed, 24 and 48 fps as standard. Speeds of 100, 200, 300, 400 or 500 fps also possible. Two pre-selected picture frequencies (e.g. 24 and 400 fps) can be engaged whilst shooting by means of a two-stage switch integrated in the hand-grip.

Special features: the rapid-change magazines contain the entire mechanism necessary for transporting the film, including the register pin system.

A thermostatically-triggered heating element built into the camera provides the necessary working temperature when shooting under very cold conditions.

Weight of the camera ready for operation: 7.4 kilo/16.2 lb.

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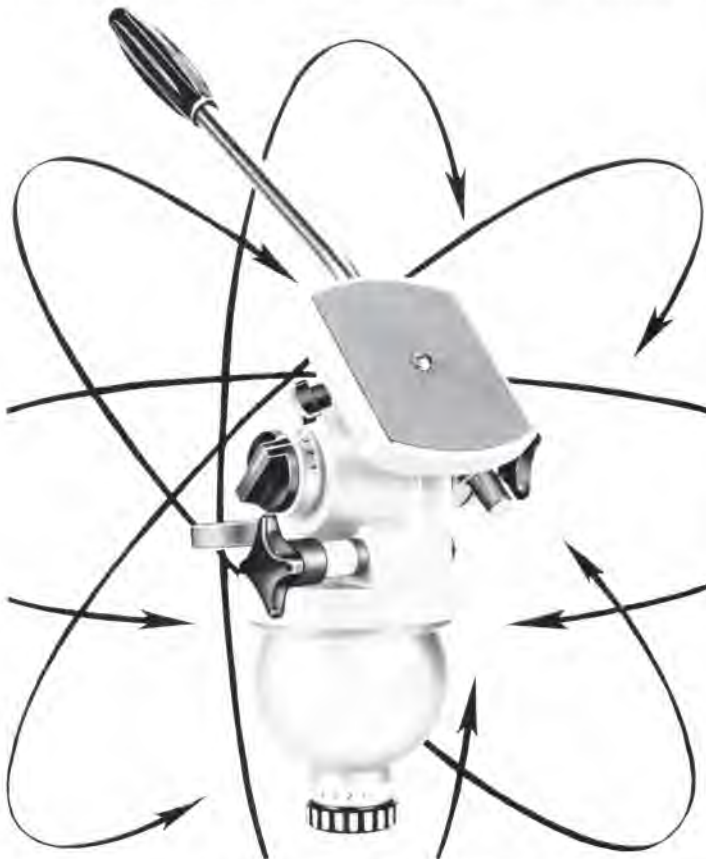


Cinematic I. The new fluid pan/tilt head for smooth panning. Fine dosing of the torque which remains constant once set. Guaranteed reliability between +60 °C and -25 °C.

cinematic

Cinematic II. A new fluid head with two-way hydraulic system for professional use in the fields of cine, video and television. Both the horizontal and vertical panning axes are provided with an adjustable degree of resistance. Since all hydraulic moving parts are sealed against dust or moisture, the assembly requires no servicing. No noise is generated which might spoil the recording when using direct-sound cine cameras. When mounted in the Linhof twin-shank tripod or other Linhof professional tripod with levelling facility, the Cinematic can be squared off 15° in any direction.

Both the Cinematic heads are characterized by pleasing design and modest weight. This is to be expected of Linhof products!



PROBLEMS IN TELEVISION ENGINEERING

WHAT IS ELECTROSTATIC STORAGE?

1. The poor utilization of light in the fade-out method

In television recording with, for example, a Nipkow disc, only that part of the light is used which, having been reflected from a scene and passed by the lens, penetrates the respective aperture in the Nipkow disc. Let us assume that such a hole has the diameter of the width of a line $b = H/600$ (H = height of image, 600 = number of lines, picture format = 4:3), then the ratio of the light flux used to the entire amount of incident light is approx.

$$(H/600)^2 \div (H^2 \times 4/3) = 1 \div 5 \times 10^5 = 2 \times 10^{-6}$$

This implies that only a two millionth part of the available light is actually exploited. In this manner it is therefore impossible to build apparatus which comes anywhere near being "sensitive". For this reason the uneconomic fade-out method is rarely encountered in television today.

2. Improved light utilization through electrostatic storage

All camera tubes currently in use, i.e. the image orthicon as well as the vidicon, function on the principle of electrostatic storage (also known as charge or accumulation storage). In any form of charge-storage tube we find three different basic processes at work:

- The conversion of light energy into electric energy.
 - The continuous storage of electric energy in the form of a charge image.
 - The gaining of an electric signal through evaluation of the charge image which is scanned by means of an electronic beam. Each time the original "state of charge" is restored, so that recharging can commence once again.
- In this fashion one can make use of the entire light energy which is available during any picture period. The energy is stored at each individual spot of the image until the beam comes along in order to "collect" it. According to the magnitude of the stored energy, electrons are released, resulting in an impulse of current, and from the latter the image signal is obtained.

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PRÄZISIONS-KAMERA-WERKE GMBH
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PROBLEMS IN TELEVISION ENGINEERING

Common terms in television illumination

High-key style

Soft form of illumination for pictures in which the tones are restricted to grey and white; dark grey or even black may also be present, but are confined to only very small areas.

Low-key style

The tones of the resulting pictures lie principally between medium grey and black; light grey tones or white are only to be found in fairly small areas of highlight.

Key light

This is the main, directional light which illuminates the actors or central part of the scene.

Base light

This is a diffuse lighting which evenly illuminates the entire scene. The level is usually adjusted so that an optimum aperture for the camera can be selected. The base light is often supplemented by further light sources.

Fill-in light

This is an additional source in order to brighten shadows or to reduce the level of contrast.

Cross light

This is a symmetrical set-up consisting of two lamps arranged at equal angles on both sides of the camera axis.

Back light

This is a light source coming from the rear and it is used to brighten up, and hence emphasize, the contours of an object.

Eye light

This is a directional, point source of light which is reflected by the eyes and teeth; it does not make any great contribution to the general level of illumination.

Set light

This is a separate lamp to illuminate the background or part of the decorations; it has no effect on the exposure of the actual subject.

D. Nasser

Linhof

One of many



LINHOFF tripods are known the world over for their precision, high-quality and serviceability. Rigidity, maximum freedom from vibration or torsion are to be found in every tripod. The Record Flex, a tripod as it should be; light, firm, high and with a special feature: on releasing the top rapid-clamps, the braces glide down the legs until they reach an optimum position for working comfortably near floor level. Send for illustrated literature. We shall be glad to help you solve that problem.

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CIBACHROME A PRINT SYSTEM— SIMPLIFIED METHOD OF PRINTING SLIDES

Not so very long ago, the only way to obtain opaque colour prints—and this applies to the professional photographer as well as the amateur—was to make enlargements via colour negative film. Perfect results could only be achieved with the aid of costly equipment in the darkroom and, possibly even more important, a properly trained lab assistant.

In order to get enlargements from colour transparencies at all, one had to fall back on the expensive and time-consuming method involving internegatives.

The first simplification was the introduction of the direct reversal paper "Cibachrome" in 1973. Unfortunately processing of this material remained in the hands of relatively few special labs. Partly on account of the complexity of the chemistry involved and the large quantities in which the rather expensive materials were delivered by Ciba, this state of affairs continued, and prices for the consumer (mostly professional and industrial users) were accordingly high. Nevertheless, the advantages of Cibachrome soon became general knowledge in the trade: extreme sharpness, natural, brilliant colour rendition and unparalleled resistance to fading.

Kodak took the next step with their so-called "layout paper", Ektachrome RC 14. This plastic-coated reversal paper enabled the average user to print directly from transparencies. However, it does involve a second exposure and high temperatures (30 or 40 °C) which means additional temperature-control equipment, even for the amateur.

With the introduction of the Cibachrome A Print System in 1975 the amateur as well as the professional was at last presented with easy-to-work materials which meet the most exacting requirements and offer a number of considerable advantages into the bargain.

The A Print System is based on a process developed by Ciba-Geigy Photochemie in Fribourg, Switzerland. Unlike conventional colour processes in which the colours are created during development by means of so-called colour-couplers, Cibachrome already contains high-quality azo dyes in the silver halide emulsion, and during the dye-bleaching stage the dye is removed in all areas where there is a negative silver image, leaving in effect a positive dye image. This is the reason why a positive colour image results on exposure to a projected transparency. The greater sharpness is also due to the structure of the emulsion layers: there is less scattering of light within the emulsion.

The dyes used in Cibachrome also exhibit outstanding saturation of the colours and, as already mentioned, are especially fast to light. Processing in three-bath chemistry at 24 °C takes a mere 12 minutes, and a 1½-degree fluctuation will not have any disastrous effect on colour balance. The exposure latitude is quite astonishing.



Top: The entire range of materials supplied by the manufacturer.

The Cibachrome A Print kit comprises the "paper" (20 sheets of 8×10 inch plastic), chemicals for making up 2 litres of working solution, a daylight drum, a set of subtractive printing filters and a detailed instruction book. For the actual exposure one may use a conventional enlarger with a filter drawer or one fitted with a colour-mixing head. Cibachrome material itself is a white, opaque plastic base coated with the light-sensitive emulsion on one side and an additional gelatine layer on the "back" to improve flatness. Normal drying in the air produces a perfect high-gloss finish without any further trouble.

Cibachrome A is supplied in hermetically-sealed, light-tight packets which protect the material from moisture and harmful vapours until it is opened. The quality will not deteriorate if it is kept at a room temperature of about 20 °C for a few months, but if longer storage is envisaged it is better to put it in a refrigerator.

The colour correction filters included in the kit are of uniformly dyed acetate foil and somewhat more resistant to

This colour photo taken by Uwe Behrendt, Frankfurt/Main, was selected by the Editor as the original transparency for a Cibachrome test series. It contains graded shades of those "colours" which really put a film material on trial: white, gray and yellow are combined here in a tone-in-tone motif. It passed with "flying colours", which only goes to show that Cibachrome A Print is not only worthy of the amateur's attention.









mechanical damage than the gelatine type. Should the 4¼ inch filters prove too small for some professional apparatus, one can always use Kodak CC or CP filters. Of course, such filters must not be placed in front of the lens but only between the light source and the negative/transparency carrier. The UV filter should always be left in the filter pack.

The P 12 chemistry required for Cibachrome A consists of the developer in two parts (may be made up separately), the bleaching bath in one dry and one fluid substance (cover up quickly, it doesn't smell very nice!), and the fixer. With anti-pollution in mind, the makers supply a neutralizing agent which ought to be added to the exhausted solutions before pouring them down the drain.

The developing drum which goes along with the kit accepts 8×10 inch prints (we have been promised larger formats one day) and greatly facilitates the processing, since after the paper has been exposed and loaded in the dark, the rest of the procedure may take place by normal room lighting.

Turning to the subject of the correct filtration, it is important to know the so-called "Grundfilterzahl", the basic filtration number. Each packet contains data about the correct filters for several well-known makes of reversal film. These data figures usually vary from one emulsion batch to the next and indicate a filter combination which led to a perfectly balanced print under factory conditions. The suggested combination can only be taken as a "guide number", since consumers' enlargers vary widely in character and type of illumination source. This is the reason why each user has to work out his own "enlarger factor" which, however, then stays more or less the same.

Taking the filter data supplied with a new packet, one prepares a test series from a neutrally balanced slide and, when each strip is dry, it is compared with the original slide, adding filters to see whether an inherent colour cast can be eliminated. Should the print, for example, now seem to have a yellow hue, this colour filter value must be reduced—assuming a yellow filter was in the pack.

Alternatively, magenta and cyan must be increased. It is also possible to correct a certain amount of colour bias in the original slide in this fashion.

As far as the exposure is concerned, one must just try to imagine that one is working with slide film, since too much exposure will give results which are too light and vice versa.

So, after noting the batch number on the packet and carrying out a test series to establish the filter combination for one's own enlarger, the worst is over as far as filtration is concerned. Provided one does not wish special or off-beat colour effects, it is possible to keep this filter pack for *practically all* other slides on this particular kind of reversal film.

To conclude, here is a practical tip: If one proposes making paper prints it is better to avoid contrasty lighting and select, from the outset, one of the soft-working high-speed emulsions. Reversal papers cannot cope with high-contrast subjects and then there is an inevitable loss of detail in the shadows or highlights under such circumstances. Highspeed films are perfectly suitable for projection, as usual, and there will be much less difficulty in obtaining good quality in the print.

Left: A page taken from a catalogue produced by Harry Langdon, Los Angeles. It is just such subtle nuances of colour which Cibachrome can reproduce so faithfully.

pratique du grand format

large format photography



by Herbert
Althann,
Hans Bluth,
Jim Gordon
and J. Gerber

Format:
9×11¼ in./
23×29 cm.,
240 pages.
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order card.

The most comprehensive work on large-format camera technology.

The present book has been brought into line with the very latest practices in this field. It is only possible to fully exploit the great technical scope of a high-performance large-format camera when one is thoroughly familiar with the theory of camera movements. This is just the aim which LARGE FORMAT PHOTOGRAPHY has so successfully achieved. It deals logically with the problems inherent in professional photography in a concise and highly lucid manner. Practical solutions to countless tricky situations which crop up in modern photography are described in detail and illustrated with clear examples. The reader is given, in a lively fashion, an advanced course in camera movements which he can then apply in practice.

The contents include: the large format – basis of high-class applied photography – lenses – the various camera movements – extension of the camera for other uses, i.e. enlarging, copying, photomicrography – filters and their application – artificial light and flash – tripod technique – panorama photos.



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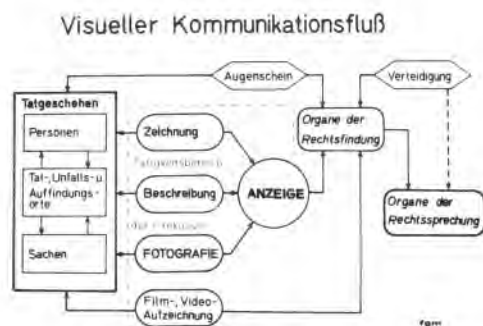
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LARGE AND MEDIUM-FORMAT PHOTOGRAPHY IN THE WAR AGAINST CRIME

by the Director of the photographic department at the Police Training College, Mödling, Austria, Franz Ginner



Top right:
Identification photography in the 19th century.
Reproduction of a contemporary drawing.

Top:
This diagram illustrates the general flow of information in the administration of justice in Austria. The deed has to be recorded by means of verbal description, drawings, still photography, video or cinematography in order to constitute a dossier which is then passed on to the legal authorities.

All drawings were made and photographs taken by the author, Franz Ginner, Mödling, Austria.

The role of photography in criminal investigations

The police employ photography as a means of making evidence visible to the legal authorities and juries. Such optical records are usually supplemented by a scale included in the picture and a written text.

The various subjects involved in criminology

In order to give an impression of the manifold tasks facing the photographer in criminology, the most important fields have been outlined below. It is not really correct to describe the present subject as a "branch of applied photography", because it calls for techniques and skills peculiar to many different fields of applied and scientific photography.

Landscape photography

In keeping with the criminal procedure of "closing in" on a subject, the police photographer also differentiates between an overall view, the object of interest itself, a view of detail and, finally, photomicrography. The scene of a crime or an accident, i. e. the whole or parts of a terrain which the police considers significant, are photographed in individual shots to form a panorama, and sometimes aerial photography or stereophotography are employed, too. Of course, the expression "landscape" includes all manner of technical facilities, such as traffic lights, which happen to be integrated in the scene.

Architectural photography

The fact that buildings of every kind can serve as the background to a crime or accident means that the police photographer must also be able to cope with the problem of giving a perspectively

correct, undistorted view of architectural subjects. This, in turn, implies that he must be thoroughly familiar with the movements on an adjustable view camera so as to give a realistic impression of the interior or exterior of any building.

Industrial photography

In the case of factory accidents, offences contrary to the regulations concerning the protection of the environment, sabotage and cases of spying, the officers of the crime department have to carry out investigations which can be greatly aided by the medium of photography.

Photography in forensic medicine

Corpses, separated parts of the human body and individual organs have to be photographed at the most various stages, often under extremely difficult circumstances, partly at the place they were found and partly during an obduction. Subject for the camera are also injuries to living persons, clues left by humans or animals as well as the various forms of excretion and secretion in connexion with living beings. In this field it is preferable to use a large-format camera.

Portrait photography

A photographic record of the face and entire figure plays an important role in the identity and recognition of wanted persons. Here the photographic and lighting techniques are similar to those applied in general studio portraiture.



Top left:

Photograph of a finger print on a window shutter or shade. The upward direction is indicated by means of a paper arrow, and location of the clue is facilitated by the paper ring. Do not use chalk!

Top right:

Close-up detail of the finger print in fig. 1. In the case of finger prints as clues there is no need to include a scale of any sort, since it is not a matter of size but the course and configuration of the papillary lines.

Process photography

In the case of crimes which involve documents of one sort or another the text itself or alterations to same have to be recorded photographically. In many cases decisive evidence can be obtained by using special techniques such as infra-red, polarization, X-ray or fluorescent photography. A view camera, or medium-format SLR with bellows, enables one to take a picture of the entire document and then "zoom in" on the forged line and also quickly change from one special type of film to another.

Product photography (still-life)

Objects commonly used in daily life which have been involved in some criminal deed or may even have been employed as a weapon are also typical motifs which the police photographer is called upon to record. His methods might be described as similar to those of the advertising photographer, in so far as an *objective* representation is concerned. For such work he prefers to use a view camera of the monorail type or a medium-format SLR camera.

Photomacrography and photomicrography

Apart from Science there must be hardly any other profession which concerns itself so intensely with this field as criminology. Photography concerned with the detection of clues might be regarded as the 'Advanced School of Crime Photog-

raphy'. Cameras which permit the exploitation of the Scheimpflug law (extending the depth of field) and the mounting of macro lenses on a long bellows extension are especially suitable for this field.

At the extreme ends of the spectrum

Photography exploiting the electro-magnetic waves at the fringe of the visible spectrum, i. e. utilizing ultra-violet or infra-red rays, is also of significance in helping to supply evidence in the struggle against crime.

The travelling public has become familiar in recent years with the need for X-ray photography in detecting the weapons of would-be hijackers at airports. However, the crime experts can also call on quite a number of other scientific methods involving light-sensitive materials. For example, stereophotography with stereophotogrammetrical cameras or special 35-mm-cameras, not to mention the use of various forms of video recording during public demonstrations and acts of terror, or for the supervision of traffic, the safeguarding of endangered objects, either mobile or stationary, for the reconstruction of crimes and internal training purposes, etc.

Photography under unfavourable lighting conditions

Unlike the majority of commercial photographers and practically all amateurs, the police photographer is seldom able to

choose the most favourable point of time for his work. He must be skilled at producing technically acceptable results during any kind of weather and at any time of day or night. In this respect his work is made easier with the aid of a medium-format SLR with a bright focusing screen.

News coverage

It has proved disadvantageous for the eye-witness reporter to be laden down with a battery of 35-mm cameras and range of lenses, even if the latter are "permanently" mounted. One should not forget that through sectional enlargement an 80-mm lens on a 2¼ square camera is equal, in effect, to a 35-mm camera with normal and telephoto lenses—which have to be interchanged. A popular choice for this kind of reportage is the twin-lens Rolleiflex with prism and pistol handgrip.

The technical quality of the pictures

The smallest size of photo acceptable in police circles for evaluation is 4×5 in. The more ideal 5×7 in. format is less often used, probably for reasons of economy. In individual cases even larger formats are employed (e. g. impressions of shoes which are enlarged to life size). There is no doubt that large or individually shaped prints, since they break the one-size tradition, can have a more convincing impact on a jury. If the originals can be

taken on roll or sheet film there will be an "enlargement reserve" which may have to be exploited in extreme cases.

The most important points to observe as far as the quality of the negatives in crime detection is concerned are the following: adequate depth of field, full range of gradation, correct reproduction of colour or grey tone values, the inclusion of some known object to indicate the scale, the ability to pick out desired details as clearly as possible. In order to give as realistic an impression as possible, photographs should be taken orthographically. More than any other type of apparatus, the adjustable monorail camera will aid the skilled crime photographer in obtaining a life-like representation.

Photography of fires, arson and other criminal deeds

Apart from officers from the crime department there are unlikely to be more than a few Press cameramen and an occasional amateur on the look-out for a dramatic competition shot to be found taking pictures at a fire. The assignments call for techniques common to the fields of architectural and industrial photography and, in detecting clues, close-up photography or even photomicrography.

There is, in fact, no patent recipe "How to Photograph a Bank Robbery" or the like. There must have been criminal cases where *all* of the above categories

Top:

Alterations to an automobile registration number. The "forged" number plate has been supplied with a county or state disc (Landratsamtstempel) which had been removed by force from another vehicle. Rollei SL 66 with 80 mm f 2.8 Planar, full bellows extension.

Close-up of the "Landratsstempel" as described in fig. 1. Camera data as previously, only with the Planar in reversed position.

Ballistic traces left in cloth. Rollei SL 66, 120 mm f 2.8 Planar used in reversed position on full bellows extension.

Photomicrograph of the lower bullet hole to be seen in fig. 1. Rollei SL 66, 40 mm f 4.5 Luminar, scale of reproduction 16:1.

Colour page:

Top row, left, upper photo:

A piece of cloth exhibiting traces of dirt and from which a scrap has been torn out.

Below:

The missing bit of cloth is fitted into the original material.

Top row, centre:

Sectional reproduction of a forged passport (according to the Convention of 28/7/51 re. refugees identification papers). Linhof Kardan 45 S, illuminated with 2 halogen lamps of 1500 watt each arranged at a distance of 5 ft. and an angle of 45°, Full bellows extension.



Top row, right, upper photo:

Here we have an optical illusion. Through illuminating the match box from the right-hand side (in order to show up the strike marks), it appears longer than in the lower illustration.

Below:

In this case the illumination was arranged from above, causing the match box to appear broader than in the first picture. In both cases, the rule was raised up to the height of the striking surface.

Centre row, left:

Damaged cylinder lock. The scale was not positioned at the right height here, is no longer sharp and therefore an exact determination of size is not possible.

of motif have occurred. The police photographer must therefore be prepared to cope with all manner of assignments and adapt his approach to the particular problem to be solved.

The medium-format camera in traffic safety

In the recording of traffic accidents, the roll film camera seems to be gaining steadily in popularity. At the scene of a typical accident it is usual for 6 to 8 photos to be taken, more than 16 is not common even in major, complicated accidents. This means that the 120-size roll film (or 220 if necessary) is ideal for the job and costs little more than a 12-exposure length of 35-mm film. Of course, the greater detail is a good argument for the roll film camera.

To conclude, the crime authorities are unlikely to join in every photographic craze which happens to come along. On the other hand, they are observant and will show an interest in new equipment which is applicable to crime surveillance. Any specialization in equipment is bound to be influenced by the organization of the local police force. Yet, in view of the highly varied tasks involved, which are concerned with practically all fields of applied and scientific photography, it is certain that the large-format view camera and roll film reflex camera will continue to be important tools in combating crime.

Centre row, middle:

Here the scale has been raised until it is on a level with the embossed numbers. It is now sharp, but care must be taken to ensure that even an apparently matt rule does not reflect the light source which, in this case, was a Rollei E 27 computer flash unit.

Centre row, right:

The same cylinder lock taken from the front. Differences in material are much more easily detected on colour film than black-and-white.

Bottom row, left:

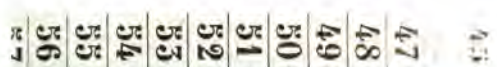
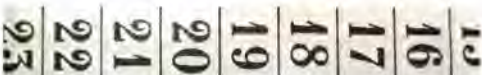
Photomicrography in criminology. A coining die for minting false two-shilling coins (Austria). The measure rule was arranged to coincide with the height of the top surface of the coining die. Same camera data as above, but less acute lighting angle.

Lower row, right:

A shoe polish box filled with plastiline (plastilina) for making an impression of keys. Linhof Kardan 45 S, 150 mm Symmar.

Lower row, centre:

Colour patches for the filter test. Samples of blood against backgrounds of differing colour. Kodachrome 64 film, Rollei SL 35, 50 mm f 1.4 HFT Planar.





Combi development of lith material— how to control that contrast

by Dr. Arthur Gewehr

Attempts to alter the contrast of lith material in conjunction with lith developers usually lead to somewhat unreliable results. A discontinuance in tonal value results, giving a false rendition. Thoroughly usable results, which are perfectly controllable, can be obtained through the combined development of lith film. Let us take, for example, the Agfa Gevaert Gevalith contact film; this material may be processed in either lith or Metol hydroquinone developer. The following is a short description of the various stages: The negative is contact-copied on to the above-mentioned lith film. Development takes place first of all in G 8 p and, after thorough rinsing, in G 2 p or G 3 p.

Through the duration of the development in G 8 p, it is possible to control the relationship between the line representation and the continuous-tone reproduction. For the lith development one should take as a basis a time of 1.5 minutes. The first development stage is followed by further processing in G 2 p or G 3 p. This second stage should continue for about three minutes. The exposure should be adjusted accordingly in order to maintain these processing times. If one is too generous with the exposure, one will have, at the very first stage, a fully-fledged lith result and no further scope will be left for the continuous-tone reproduction. An exposure test series is absolutely necessary, and it will show just *how* different the results can be.

In the Combi-development, a negative is then prepared from the transparency in such a way that no shift in the tonal values occurs. Using Gevatone 31 p and developing in G 2 p, one is usually soon on the right track. One will not be able to print from the second negative photomechanically on to paper of normal gradation. With carefully controlled procedures, it is possible to print on special, normal and (at least as a trial) on hard paper. The purpose of printing on papers of varying gradation is to obtain a result which most closely approaches the transparency.

Now that the aim and techniques involved have been outlined, it is worth while drawing attention to the following: The developers G 2 p and G 3 p were recommended for processing the lith positive in the second stage of development. G 3 p gives a somewhat higher contrast than G 2 p. Through an appropriate choice, the continuous-tone result can be influenced. The contrast between line and continuous tone can be attenuated, on account of the brilliant rendition, via G 3 p. I personally prefer to work in stage two not only with G 2 p but also with G 3 p in order to exploit all the possibilities of the interplay between line and continuous tone. Such fine nuances can only be obtained, however, if the film is given the minimum necessary exposure, and the lith developer only affects the areas of greater density as described above.

LET THE COLOURS RUN

An experiment on the border of photography

by Dr. Arthur Gewehr

The photographer Chargesheimer who died at a rather early age was a most versatile artist. He took glass plates, poured on to them thinned poster colour and, through turning and swivelling the plates, achieved fascinating smears of colour. The resulting "picture" was photographed (in black-and-white at that time) and later enlarged on to photo paper. The results, characterized by finely-graded tones in juxtaposition to sharp contrast, had an undeniable appeal.

Today Chargesheimer would not work in monochrome, but select a variety of lively hues. One has greater freedom of manipulation when the original plate is laid horizontal and photographed with a vertical camera. For this purpose, the original is placed on an opal sheet, which permits one to illuminate it either partially or entirely with coloured light from below. Small spotlights of different colours may be arranged on each side below so that their beams partially mingle. Alternatively, colour foils may be interposed. The original may have to be blocked up a short distance from the baseboard in order to make space for the small spotlights. Colour runs in the form of original copy (as opposed to a "negative" in the enlarger stage) permit one to exploit the full scope of colour gels, respectively positive filtration. At the first glance one might think that this is a job for a graphic artist, but the uninitiated will soon realize that the photodesigner has definite advantages — although the starting point was not strictly "photographic".

Spots and filter gels are not the only means of manipulating the photography of such colour graphics. Let us take, for example, the use of several soft-lens attachments which refract the original — as it is being illuminated by transmitted light — into a glitter of opalescent colours. Then, a sheet of glass on which Vaseline has been smeared may be inserted in the compendium of the camera for an even more diffused effect. Of course, the grease does not have to be applied to the entire glass plate; a mixture of sharp and hazy colours is obtained by a selected, local application.

The techniques involved in producing such "dynamic colour" do not require a lengthy explanation. The glass plates, on to which the colour should be sprayed, sprinkled or spread, should be absolutely free of any grease in order to avoid the formation of droplets. One can use old, stripped photo plates, say 5×7 in., since they are easy to handle when turning and swinging. Interesting and easy-to-control runs result just when the pigment is beginning to dry. A small brush can be used to help the drops on their way when they tend to stop. Be sure that a brushmark is erased by the flow of colour. After all, the aim of our work is to bring about patterns which are freely created or, at least should not show the signs of manipulation and not to compete with painting.

Colour applied in a very thin film has an excellent "image sharpness". It is possible to thus enlarge the original many times, whereas thick layers of pigment tend to produce unsharpness. (The reader is probably aware of the same phenomena to be observed in thin-emulsion versus thick-emulsion photographic film.)

Colour graphics in combination with real photographs open up interesting possibilities: it is in *contrast* that the higher entity comes into its own.

Mani pulation

what is that?

In still photography the expression "manipulation" does not necessarily have to be associated with that kind of influence which many a film director tries to exert in order to channel the viewers' thoughts in a particular direction. The reason is that the skills of manipulation in these two fields are quite different.

If the director wishes the public to take up two completely opposing views of a scene in TV or motion pictures, for example, it is sufficient to supply the same passage with two different commentaries. In addition, there is always the possibility, through clever cutting, of directing the audience's attention to some particular point without leaving out any scenes essential for the "content" of the film.

That is not possible in still photography, at least not in this fashion. A picture caption may lend emphasis to the "message", it can explain the contents, but it cannot change the former. Also the personal attitude of the observer to the problem presented in the picture takes priority, a situation which may not, in every case, be assumed in the field of motion pictures. On the contrary, here the author has first of all to start the observer thinking along the right lines and then more or less manipulate him.

The greatest difference, however, is to be found in the fact that a photo will always stimulate the imagination of the reader, since he usually has much more time to come to terms with the visual message contained therein.

In this context, the juxtaposition of two, or more, pictures is a familiar method of photographic manipulation. If, as is a case with the two accompanying pages, the contents do not appear, at the first glance, to be connected in any way, the phantasy of the observer is, we believe, incited even more. The fact that a picture caption has been excluded here is possibly the most subtle manipulation of all. What do you think?

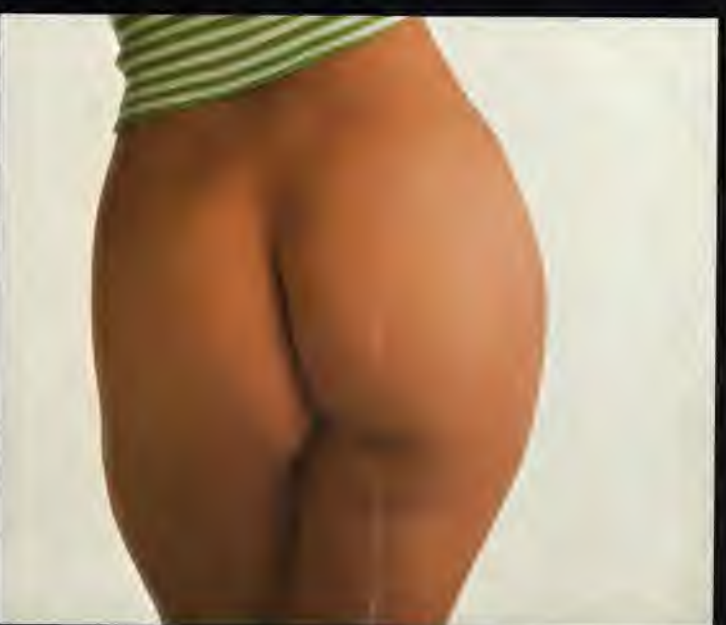
F. Brandrup

Left: "The Curious Pig". This is the type of motif which lends itself to manipulation. Karl-Horst Schwertfeder, who took the photo, gave it another title: "Hallo, Neighbour!" One could, however, give it quite a number of captions, such as: "Ugh! Some fresh air at last!"

Right: Series such as this are highly suitable when one is trying to invent a story. What did YOU first think of when seeing these pictures, especially with regard to the contrast between the two pages?

Photos: Werner Unger, Cologne







An interesting observation:

marvel in an



egg-shell

With

the

aid

of

his

camera

the

photographer

recorded

the

various

stages

which

a

fertilized

egg

undergoes

before

the

chicken

is

ready

for

hatching.

Bo

Jarner

of

Copenhagen,

a

photographer

who

is

very

interested

in

animals

and

nature,

asked

himself

one

day,

as

he

cracked

open

his

breakfast

egg,

what

actually

happens

within

the

shell

of

a

hen's

egg

if

it

is

allowed

to

hatch

instead

of

being

consumed.

His

curiosity

was

prompted,

of

course,

by

the

question

whether

one

could

photograph

the

various

stages

of

development.

As

he

rose

from

the

breakfast

table,

he

had

already

decided

that

the

experiment

was

worth

while.

In

one

side

of

a

cardboard

box

he

cut

out

a

circle

so

that

he

could

instal

a

500-watt

lamp

in

the

box

and

turned

the

latter

so

that

the

light

pointed

upwards.

In

the

top

surface

of

the

box

he

cut

out

a

small

hole

for

the

egg.

In

this

fashion

it

was

thus

possible

to

transmit

light

through

the

egg

and

photograph

the

interior,

just

as

if

the

lamp

had

been

inside

the

shell.

Later,

when

the

embryo

was

no

longer

so

transparent,

he

had

to

employ

an

additional

lamp

which

was

arranged

to

illuminate

the

egg

from

above

as

well.

Colour page: Fig. 1:

The ninth day of development of the embryo. The opened egg gives the impression of a map of a country abundant in rivers. Even at this stage, however, one can already discern certain details of the embryo.

Fig. 2: Fifteenth day. The embryo is gradually developing into a chicken. Recognition is less difficult, and the first signs of downy feathers may be seen.

Fig. 3: Eighteenth day. Three days before hatching, the embryo now occupies practically the entire oval of the egg.

Fig. 4: Hatching out.

Black-and-white photo, top:

The photographer Bo Jarner (Pressehuset, Copenhagen) in his studio. He is seen removing the skin, membrana putaminis, from an egg with tweezers. In spite of a steady hand, a number of egg specimens was damaged.

Bo Jarner, Kopenhagen

Page 68: a very special photo.
Photo: W. E. Lautenbacher, Germany

For reasons of safety, 30 eggs were placed in an incubator, so that in the final, crucial stages the experiment would not be jeopardized for lack of a "model". As it so happened, luck was on his side, practically all of the eggs were fecundated and, when the photography was finished, he had only used seven eggs in all.

Painstaking, finicky work was required. For example, a hole had to be bored in the shell, then a small piece of shell and skin removed with pincers. It sometimes happened that the embryo was not in the correct position in relation to the camera angle, which obliged the photographer to sometimes wait until, of its own accord, the embryo assumed a more favourable position for photography. Each picture took up about three hours. At intervals of about three days a new egg was fetched from the incubator wrapped in a scarf to ensure that it was still warm on arrival in the studio. One can imagine, of course, the great number of exposures which was necessary for the series; what is more, experiments had to be carried out at each stage.

One can now say that it was worth all the trouble.

D. Nasser



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PHOTOS 7

Photokina – World Fair of Applied Photography

Equipment for the lab and studio as well as audio-visual aids are important topics

The photokina, the "World Fair of Photography", which takes place every two years in Cologne, has always been regarded as a milestone marking important developments in the photographic trade. It is, at the same time, the largest exhibition in the fields of scientific, industrial and commercially-applied photography. So when the next photokina takes place between the 10. and 16. September 1976 this domain, which makes up more than half of total turnover in the photographic branch, will receive its due marketing space.

A rendezvous of high potential

This concentrated market is of particular interest to the manufacturers of specialized photo products from all over the world, since they know that potential buyers from many countries come to Cologne for the photokina. It is especially in the field of applied photography that one finds a large number of small manufacturers who regard the photokina as an efficient and economic access to the international market. The role of the photokina as a contact potential in all directions then becomes most obvious. The various sectors of the photographic industry have been allocated a total of about 35,880 sq. yards of exhibition space in the East Hall Complex of the Cologne Fair Grounds.

Special show for photofinishers

In Hall 10 at the photokina one will find a display of equipment for small and medium-sized custom labs as well as the impressive machines for large photofinishers. The 11,900 odd sq. yards set aside for this purpose has already been fully booked up. One could say that the range of relevant products is more or less comprehensively represented. It is an established fact that photofinishers from all over the world — their orders run into thousands of millions — are using the photokina to an increasing extent as a rendezvous where they may obtain information about the latest developments in laboratory technology.

A survey of hardware for the studio

Another vital sector is studio equipment with particular reference to color photography, motion pictures and television. Exhibitors in this category will be found in Halls 9, 10 and part of 12. One can obtain an overall impression of the most modern international trends in studio fittings which, after all, represent the only reliable basis for obtaining good results in a rational manner.

AV Fair within the photokina

During the World Fair a special show entitled "Audiovision" will also be running. All aspects of audio-visual technology will be represented: the still as well as the motion picture, the traditional photographic/electronic basics, from simple to multi-screen and multi-media systems, goods from the so-called software as well as the hardware sides. The "Centrum-AV-Communication" (for short, "cAVcom") a group of leading German producers of sound slide show, multivision, movie and video programs, will be putting on a joint demonstration of AV software in Cologne between 10. and 16. September.

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